

# The Electragist

Applied Science Dept.  
Applied Science Dept.

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Vol. 25, No. 10

Association of Electragists  
INTERNATIONAL

AUGUST, 1926

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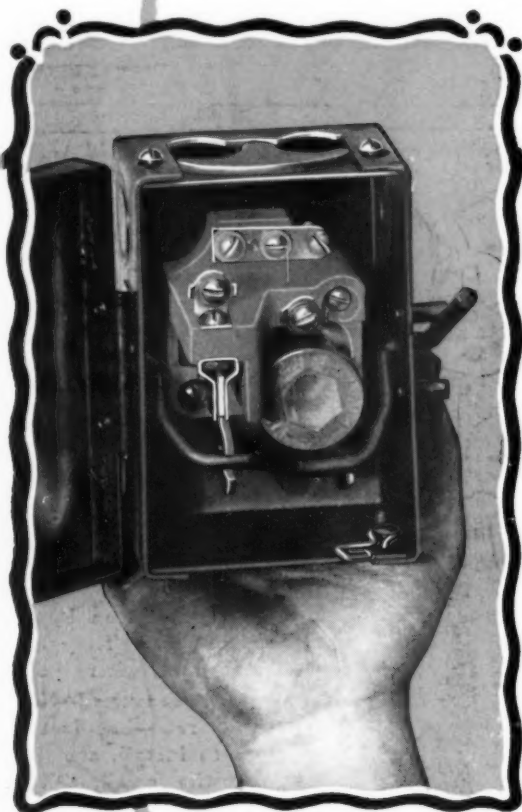
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Note the end plate, an exclusive feature of the "77" switch. It makes wiring and the fitting of conduit a very simple matter.



By loosening two screws, end plate may be withdrawn after conduit is in place, simplifying wiring. Terminals are placed near conduit entrance so that it is not necessary to remove switch from box to wire.

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# SAFETY SWITCHES



# *The Electragist*

(The National Electrical Contractor and The Electrical Contractor-Dealer)

Official Journal of the  
Association of Electragists—International

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No. 10

## Cheaper Wiring Not Needed or Wanted

### Survey Discloses No Demand for Retreat from All-Metal Standard and Its Advantages of Lower Fire Losses and Insurance Rates

FOR some time there has been a movement under way to reduce the cost of wiring. The desire of certain elements in the industry to do this has been prompted by their expressed belief that a comparatively high cost of wiring has retarded the use of electricity because of public unwillingness to pay the price of the highest grade installations.

Any drive for cheaper materials focuses attention immediately upon the All-Metal standard now required in many communities. Since All-Metal is the real point of attack in this campaign THE ELECTRAGIST has made an investigation in those cities which are on All-Metal basis, with the view of ascertaining local feeling on the subject and local experience with All-Metal.

Is there any call for a return to Non-Metal standards? How does the percentage of homes wired in these communities compare with the percentage of available homes wired throughout the country? What KWH rate has each community and does it, in turn, have an effect on the spread of electricity there? Has the average number of outlets per home decreased or increased under All-Metal? What effect has All-Metal had on fire losses and fire insurance rates?

These are the questions asked of a large number of chief inspectors and prominent contractors in All-Metal cities. The replies are tabulated on the following page.

#### Mostly Armored Conductor

The answers showed that by far the greater number of these cities are on a basis of both conduit and armored conductor, only a few insisting on the use of all conduit.

Replies to the question on the desirability of the All-Metal standard are overwhelmingly in its favor. Only five out of sixty-six gave as their opinion that the public and the industry would be willing to return to a Non-Metal basis. Sixty-one voted "No" emphatically and it is to be surmised that each individual replying is familiar enough with local conditions to give an authoritative opinion. This would seemingly dispose—at least in these cities—of the contention that the public favors cheaper wiring.

#### Wired Homes

One of the most surprising facts disclosed by the investigation is this: The percentage of wired homes in All-Metal cities is greater than the percentage of homes throughout the United States that

are now wired for electricity. The figure for the entire country is slightly in excess of 75 percent. That for All-Metal cities is an average of 83 percent. Not alone is this so, but it is likewise shown that only nine replies list their communities as being less than 80 percent wired.

KWH rates in the cities covered by the survey range from 5.3 cents to 15 cents and the percentage of homes wired seemingly bears no relation to this fact. From this it may be deduced that the public does not refrain from using electricity because of installation or consumption cost, but that the amount used is dependent on some other factor—undoubtedly this is the degree to which the local industry has educated the public to the use of electrical conveniences by means of co-operative activity.

#### Outlets Increase

One indication of the public's attitude toward All-Metal is the increase or decrease of the average number of outlets in an average home under the standard. The figures obtained on this are as follows: Forty replies state that the average number has increased, with some of the increases estimated at as high as 160 and 200 percent. Only five



## Facts on All-Metal, City by City

All Conduit	Conduit and Armored Cable	Would city return to non-Metal?	Percent of homes wired	What is KWH rate for residential use?	Effect of All-Metal Standard on		
					Outlets	Fire losses	Insurance rate
x		No	100%	Cents 6.5	Increased	Reduced	—
x		No	60	10	—	Reduced	Reduced
	x	No	90	10	—	Reduced	Reduced
	x	No	80	11	Increased	Reduced	—
	x	No	98	8.5	Increased	Reduced	—
	x	No	90	11	—	Reduced	—
	x	No	80	8	Increased	Reduced	Reduced
	x	No	92	8	Increased	—	—
	x	No	85	—	Increased	—	—
	x	No	90	5.6	Incr. 90%	Reduced	Reduced
	x	No	95	9	Incr. 25%	Reduced	Reduc. 8%
	x	No	—	8	—	—	—
x	x	No	100	6.5	—	—	Reduced
	x	No	95	—	—	—	—
	x	No	90	9.5	Incr. 50%	Reduced	—
	x	No	95	9	—	—	—
	x	No	80	7.5	—	—	Reduced
	x	No	—	7.5	Increased	—	—
	x	No	70	9	Increased	Reduced	—
	x	No	95	10	Increased	Reduced	Reduced
	x	Yes	94	5.3	Decreased	—	—
x		No	90	8	—	—	—
x		No	100	8	Decreased	—	Reduced
x		No	100	5.5	Incr. 100%	Reduced	—
	x	No	99	8	Decr. 5%	Reduced	Reduced
	x	No	75	12	Decreased	Reduced	Reduced
	x	No	—	10	Increased	Reduced	Reduced
	x	—	95	10	—	—	—
	x	No	99	13	—	Reduced	Reduced
	x	No	85	9	Increased	—	—
	x	Yes	85	—	Increased	—	—
x		No	90	5.5	Increased	Reduced	—
	x	No	100	11	Increased	—	—
	x	Yes	96	10	—	—	—
	x	No	80	9	Increased	Reduced	—
	x	No	75	10	Increased	Reduced	Reduced
	x	No	100	8	Incr. 100%	—	Reduced
	x	No	60	7.5	—	—	Reduced
x		No	87	10	Increased	Reduced	—
x		No	95	10	Increased	—	—
	x	No	90	8	Incr. 50%	—	Reduced
	x	No	96	9	Increased	Reduced	—
	x	No	90	10	Incr. 100%	—	—
	x	No	93	8	Increased	—	—
x		No	90	—	Incr. 50%	—	—
	x	No	75	—	—	Reduced	—
	x	No	85	15	—	Reduced	—
	x	No	85	8	Increased	—	—
	x	No	50	10	Increased	Reduced	—
	x	No	95	8.5	Increased	—	—
	x	No	—	9	Incr. 200%	—	—
	x	No	75	9	—	—	—
	x	No	50	7	—	Reduced	Reduced
	x	No	—	7.5	—	—	—
	x	No	80	10	Incr. 50%	—	—
x		No	90	9	Increased	Reduced	—
x		No	90	10	Increased	—	—
	x	Yes	70	7.5	—	Reduced	—
	x	No	90	12	—	—	Reduced
	x	No	95	9	Increased	—	—
	x	No	95	9	—	Reduced	Reduced
	x	No	90	11	Increased	Reduced	Reduced
x		No	95	10	Increased	—	—
	x	Yes	94	5.3	Decreased	—	—
x		No	90	8	Incr. 25%	Reduced	Reduced
x		No	100	6.5	Increased	Reduc. 20%	Reduced

declared that All-Metal had decreased the average number of outlets, while twenty-one either did not answer this question or said that All-Metal had not affected the average number of outlets.

The next question, concerning the effect of All-Metal on fire losses, produced evidence that where this standard was in effect the fire toll was being considerably reduced. Thirty-two replied that it had accomplished a reduction and the remainder either did not reply or answered that they did not have any accurate figures.

## Public Savings

A direct financial return to the public, resulting from the use of All-Metal, is indicated by the replies to the last question, on the effect of All-Metal upon fire insurance rates. In twenty-three out of sixty-six replies it was stated that rates had been reduced. When it is remembered that the fire insurance premiums of a single fair-sized city run to several millions of dollars, it is easy to see how much saving a 5 percent reduction will mean to owners.

One factor in favor of the All-Metal standard which was not taken account of in the survey has been brought forward by a contractor of whom the above questions were asked. It is that a surprisingly large number of persons held a fear of electric current which greatly retarded the expansion of the industry. Electrical men commonly miss this point by reason of their more expert knowledge of electrical safety measures. Consequently the suggestion that electricity might not be safe and therefore some persons might be deterred from using it has not been definitely counteracted at any time by the average electrical concern. One of the advantages of the All-Metal program therefore has been the creation of a feeling of safety in the minds of users.

Judging by the results of the survey, a retreat from the All-Metal standard is not demanded by the industry or the public and if it did come it is doubtful that an increase in wiring would result. Increased consumption of electricity will develop not from cheapening installation but from education of the public to its advantages. Most important of all, desertion of the All-Metal standard would deprive the community of the incalculable benefits it now enjoys through decreased fire losses and lowered fire insurance rates.



# National Wiring Standard Coming?

*Leagues Granted Red Seal Licenses in Last Six Months Have  
Specifications Showing Only Minor Variations*

		Syracuse	Rochester	Niag. Front.	Pittsburgh	Louisville	Detroit	Huds. Vly.	Gr. Rapids	Mnpls.	St. Paul	Atlanta	Colorado	Tulsa	Memphis	Youngstwn	No. Ill.	Muncie	Peoria	La Crosse	Schectdy.	Tri-Cities	Milwaukee	Kan. City	Toledo	Rh. Island	Albany	Columbia
ENTRANCE or PORCH	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	N	1	1	1	N	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	or	1	1	1
VESTIBULE	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt. Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	or	1	1	1	1	1	1	1
LOWER HALL	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
	Switch—1 Way	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Switch—3 Way Conv. Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LIVING ROOM	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	2	2	N	or	4	1	2	2	2	2	2	2	2	2	2	2	2	or	2	2	2	2	2	2	2
	Switch—1 Way	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Switch—3 Way Conv. Outlet	2	3	4	4	3	2	2	2	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
DINING ROOM	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	2	1	N	or	4	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Switch—3 Way Conv. Outlet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2
PANTRY	Ceil. Lt.	1	or	1	1	1	1	1	or	1	1	1	1	1	1	or	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
KITCHEN	Ceil. Lt.	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	2	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
UPPER HALL	Ceil. Lt.	1	or	1	1	1	1	1	or	1	1	1	1	1	1	or	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
BATH ROOM	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SLEEPING ROOM NO. 1	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	or	or	1	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or	or
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
ATTIC	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FOOT OF STAIRS	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LAUNDRY	Ceil. Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	2	1	1	1	1	2	1	N	1	1	1	1	3	2	1	2	2	2	2	2	2	2	2	2	2	2	2
LAVATORY	Ceil. Lt.	1	or	1	1	1	1	1	1	or	1	1	1	or	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FURNACE CELLAR	Ceil. Lt.	1	1	1	1	1	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Side Lt.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—1 Way	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Switch—3 Way Conv. Outlet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Specifications for several minor rooms are omitted for lack of space.

N. Rochester: Rochester calls for double convenience outlets.

N. Detroit: Detroit specifications differ mainly in providing wall and convenience outlets according to running wall space. A future article will discuss these specifications.

# Why the A. E. I. Is So Strong and Vigorous on Its 25th Birthday

By S. B. WILLIAMS  
Editor, *The Electragist*

**A**LTHOUGH the electrical industry has made a tremendous growth in the 25 years since the electrical contractors formed their national association at Buffalo in 1901, the problems that faced contractors then are much the same in kind as these of today. A quarter of a century ago, however, the number of contractors was so much smaller that every contractor knew all of his competitors. Today there are between twenty and thirty thousand electrical contractors and it is manifestly impossible, except in a small place, for one to know many competitors.

Such a situation while not altering the kinds of problems does increase the size of the problems and makes national association work much greater and more intensive.

It is therefore interesting to study the progress of the Association of Electragists during its first quarter of a century of service to contractors and the electrical industry—to notice the changing thinking on the part of leaders as they broadened out with the industry,—to notice self interestedness give way to the cooperative spirit—to notice the changing reaction of manufacturers, jobbers and central stations as the Association became stronger in membership and direction.

The Association of Electragists will never have in its membership a majority of those engaged in the electrical contracting business. The group it represents is made up of men and businesses with an economic status far different from that enjoyed by any other branch of the electrical industry.

Contracting firms for the most part are small and the profits are not large. Association dues, while of course properly chargeable to overhead, nevertheless come out of the pocket of an individual—the owner or partners.

The business of electrical contracting is for the most part local and it is necessarily difficult to develop amongst men so engaged a strong national consciousness with respect to their business.

Nevertheless, the Association holds

within its membership of over two thousand, the greater part of the real progressive element of the business. Its members do approximately 40 percent of all the business, which fact in itself is indicative of their high calibre.

The Association of Electragists is unlike all other national electrical associations in another and most important way. The National Electric Light Association, the Electrical Supply Jobbers' Association, the several manufacturers' associations—all accomplish a large part of their work through committees of employees of member companies who meet frequently away from home. This takes time and money which the employer pays. In the case of this association, such committee work is not attempted because the individual cannot afford the time or the money to be away from home. While he is away his business is in most cases without a responsible head. Generally he is his own estimator and salesman. He must be on the job pretty much all the time.

## Committee Responsibility

For that reason the Association of Electragists must function differently. It has committees, but they are each composed of an individual who is a member of the Executive Committee. It virtually means that the executive committee, which meets twice a year, delegates the responsibility to each member thereof for certain activities.

This responsibility is largely of an advisory nature to the headquarters staff, although in one or two instances, the nature of the assignment calls for an amount of time from that particular executive committee member which it seems at times as though the Association were unfair in demanding.

A still further handicap of this Association is that such a large proportion of the members by the very nature of their business are not called on to handle big things in a big way. Their business problems are local and necessarily very small. Those of the members who by training have been better

equipped to handle large affairs and to appreciate national situations are most frequently engaged in large businesses which do not have the same economic problems as the small business.

With such a set-up the work of this Association and its progress have necessarily been along lines greatly different from other national electrical associations. Nevertheless, its work has been equally effective and productive for great good.

As was to be expected, the very early years of the Association were spent in organizing. Its first significant work was in connection with National Electrical Code revision and administration, and, it is interesting to note that no matter how much association activities may have lagged during certain periods, the activities of the National's representatives on the Electrical Committee have never let down. In fact, in recent years, the most important work of the Electrical Committee has been done by Article V Committee of which the electragist senior representative is chairman.

As was natural the early viewpoint of the Association was one almost entirely of mutual protection and special privileges. Twenty-five years ago men banded together, not so much for the purpose of presenting a collective viewpoint on great questions troubling their industry as for the purpose of becoming individually strong by virtue of belonging to a strong body.

Trade relations between groups were not open as they are today. Federal laws have put a stop to what in the very early part of the century was a fairly common practice. Agreements between buyers and sellers for special discounts or rebates, since declared illegal, were not then frowned on.

While it is not known now exactly what a trade association can and can not do legally, still the efforts of Secretary Hoover in the past two administrations have gone a long way towards straightening out matters.

The contributions of the Association



have been in two directions, the first almost entirely of interest to electrical contractors and the other involving relations with other branches of the electrical industry.

Undoubtedly its greatest contribution to members has been its Manuals on Estimating. The electrical contractor industry has had the reputation of doing hundreds of millions of dollars worth of construction work each year almost without having any authoritative cost data. This need has been filled by the Association's estimating manuals which are continually being checked and added to.

The Standard Cost Accounting System was compiled in cooperation with representatives of jobbers, manufacturers and the press and merchandised by the Association. Since its compilation numerous changes have been found desirable for one reason or another, and these have been made in each instance by the Association.

Estimating and standard forms have been developed for electrical contracting businesses and have been widely used.

The standard table for number of wires that conduits will take was developed by the Association as was also the standard wiring symbols which later with the aid of other interests was revised and made an American Engineering Standard.

When liability insurance was in a

most unsatisfactory condition with regard to rates the Association found a means, which is still operating, to save members a fair part of their premiums.

For a time members were furnished with all price changes. As this activity was not one that was especially mentioned as permissible by Washington

the need had first to be proved with facts.

Trade relations, which formerly consisted in preferentials for members, is now a matter of trade education. Where formerly everybody was bent on educating the contractor, the Association has found it necessary at times to

educate the other branches of the industry in the proper economic development of their business. As a result the contractors, once thought of as an unfortunate necessity, are now beginning to receive recognition due to a major branch of an industry.

Legislation was one of the first things taken up by the national and through the twenty-five years has been a major topic. A model state law and a model ordinance have been drawn up, but the latter has given way to the Uniform Electrical Ordinance compiled by the Electrical Manufacturers' Council and revised to conform to the suggestions of the Association of Electragists. More lately the efforts of the Association have been largely confined to collect-

ing data on state laws and the details of administering local ordinances.

Differences of opinion have not made it easy for the National Electrical Code to make friends locally. To improve this situation and to make local rulings more acceptable to all, the Association suggested local code committee work with each interest represented, and taking the lead did create such committees

## I Am An Electragist

**H**OW frequently, I wonder, do we find ourselves thinking with pride about being Electragists, and of the responsibilities that go with that name? Not often probably, because of another question, somewhat selfish but perfectly natural—What do I get out of being an Electragist?

While it is "more blessed to give than to receive," the routine problems of our daily struggle for volume and against overhead in the hopes of profit and self preservation has a tendency to destroy ideals in business.

Yet, it is true that we "get" in proportion as we "give," and sometimes more, and in no endeavor is this more true than in association work. There are many tangible benefits that go with membership in the Association of Electragists, but more important than all of these is the opportunity to be an Electragist.

The title—"Electragist" was conceived from the principles and ideals which have grown out of the history making achievements covering the twenty-five years of our Association life. Surely there is something more in the state of belonging than paying merely dues and receiving the organization's tangible benefits.

As I pause occasionally, calling to mind that I am an Electragist, I get a thrill, a regular kick out of being identified with more than two thousand of the foremost electrical contractors and retailers in North America. I am conscious of a sense of pride—the sort of pride that tends to build character, that creates an ambition to have my business respected as one of the worth-while assets in the commercial life of my community. Whatever success I have enjoyed as an electrical contractor, I attribute in large measure to the educational advantages which have come from my membership of fifteen years in our Association.

JOSEPH A. FOWLER,  
President A. E. I.

it seemed advisable to discontinue that practice.

Studies in the cost of doing business, first as a business, and more lately departmentalized, have given to contractors and suppliers an accurate picture of the economic status of electrical retailers that was much needed. It was all right to ask for greater margins, but



in more than a hundred leading cities.

"All-Metal" as the safest form of wiring was inaugurated by the Association and pushed in the face of the bitterest kind of opposition from non-metal manufacturers and central stations. As it is a movement in the right direction and one thoroughly in accord with American standards of wiring it is bound to succeed. Out of this movement will grow a well defined electragist standard of wiring to express the ideal of electrical installation from the standpoint of safety, economy and convenience.

#### A Leading Part

Of late the Association has come into its own and is taking a leading part in virtually all industry matters. Numerous activities before the American Engineering Standards Committee are receiving its attention. With other national electrical and insurance interests the Association is maintaining an Electrical Field Secretary of the N. F. P. A. to make the National Electrical Code what its name really implies, "National." It has called with the N. E. L. A. a national conference with manufacturers and jobbers to study what, if anything, is retarding wiring progress.

There are many other things which are not sufficiently far along to be given publicity, but it can be said that no other branch of the industry now makes a move which in any way affects the interests of the contractor or dealer but what the opinion of the Association is first asked and its help requested in formulating the right program.

The work of the Association is broader and further reaching today than ever before in the history of the Association. At the same time it is doing more for the membership individually and collectively. Whether a member wishes to know where to buy a certain product, how to keep track of stock, allocate expenses or wants a decision on technical or code matters, he gets a correct and helpful answer.

If local situations arise, as they do frequently, that are unsatisfactory to the contractor the Association conducts an investigation and does all it can to straighten out conditions—and it generally succeeds.

On its twenty-fifth birthday the Association of Electragists is to be congratulated on its quarter of a century of service. Its accomplishments are many and great, its position in the industry councils is unassailable.

## Japanese Electrical Contractor Has to Satisfy Three Electrical Inspectors

When He Puts In Wiring, His Installation Has to Meet National Wiring Regulations, Rules of Power Company and Those of Electrical Association

By HOWELL H. REEVES,  
International General Electric Company

THERE are three general types of electrical wiring specifications in Japan:

1. Tei Shin Sho, or Communication Department Specifications.
2. The Denki Keoki, or Electrical Association Specifications.
3. Individual Power Company Specifications.

The Tei Shin Sho wiring specifications are made legal by a national law. They are the only specifications that can be legally enforced.

The Denki Keoki specifications are more detailed than the Tei Shin Sho regulations, but they cannot be enforced by law. Practically all the power companies in Japan have house wiring specifications in addition to the Tei Shin Sho and Denki Keoki.

#### Power Company Rules

Usually the power companies will not connect the service unless their specifications are complied with. The power company always inspects a wiring installation before connecting its service.

There are Tei Shin Sho, or Government inspectors who inspect representative installations. If the power company connects its service to an installation which does not comply with the Tei Shin Sho specifications, and the Tei Shin Sho inspector finds it out the power company is responsible.

The Tei Shin Sho regulations are based on minimum requirements. The power company regulations often specify material far better in quality than that which would pass the Tei Shin Sho requirements.

Sometimes the power company goes so far as to specify a certain manufacturer's product because of its high quality.

According to law, or theoretically, anyone can enter the house wiring business. But practically no one does engage in house wiring without going to the power company, in whose territory they expect to operate and submitting their credentials. That is, a

person wishing to engage in house wiring shows the power company that he is financially and technically equipped to engage in this business. The power company, if satisfied with his qualifications and if there are not already too many engaged in this business, accepts his bond, or deposit (usually Y1,000) and gives him a certificate stating that Mr. Blank is appointed by them to do house wiring.

Contractors appointed this way have a better standing with the power company, and are more apt to have their work approved.

The power company usually establishes a price per outlet for certain standard classes of work. They do this without consultation with the contractors. The usual price is Y3.00 or Y3.50 per outlet installed in accordance with the power company's specifications. When an inquiry is made of the power company by a prospective house wiring customer the power company tells them that the price for standard wiring is so much, and refers them to one of their registered contractors. The power company may sign a contract with the prospective customer for the work and turn this contract over to one of their appointed contractors at the specified price. The contractor can, of course, refuse to do the work at this price, but in doing so loses his standing with the power company to a certain extent.

Special wiring requires bids. A contractor can, of course, secure business for himself at whatever price he is able to get.

#### Electricity in Industry

"Industry's Electrical Progress" is the title of a publication issued by The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., which starts out to prove that the competitive advantage which electric power brings to industry lies in the effectiveness with which electricity is utilized. The method has produced a book which men connected with manufacturing plants will find it worth while to read.

# Shall the Code Say

- 1—Whether
- 2—Where and
- 3—What Way

## Wiring Products May Be Used?

By W. J. CANADA  
Electrical Field Secretary, N. F. P. A.

WHETHER we like it or not, our civilization rests upon and promotes standardization. When standards apply to materials or devices, which may be classed together as commodities, these standards are called such. When standards apply to methods of choice for use, to methods of assigning suitable field for use, to methods of determining on proper manner of use and of assemblage for use,—of commodities which are not consumed but installed, these standards are called "codes." We may cordially dislike codes as well as standardization of materials since they do press upon us more or less—mould us and limit our free choice, but in turn we can and should mould these codes, and we cannot do without them. We cannot banish them any more than we could banish electricity, but we can make them our useful servants—not permit them to be our relentless masters.

Taking codes as we find them and examining them as to their origins, their functions and how they came to their present degree of completeness of functioning,—it is readily seen that codes never spring fully matured into being as Minerva, fully armed, is said to have sprung from the head of Jupiter. Such mature births are fables. Each code has its history of obscure origins in a chaotic or unformed art. Some phase of that art was first given conscious and then organized attention, while conscious and organized attention to other

phases of the art may have been missing or weakly represented in the code's development for many years of its early growth.

The phase of the interior wiring art

and in "what way" standard commodities might or might not be installed—our present National Electrical Code.

It will be sufficient for present purposes to give one simple illustration of the functioning of the code in each of these respects. Later we can examine into how effectively and harmoniously (or otherwise) these three functions have developed in the 30 years since the code was an infant. Later also we can examine certain analogous treatment of these three functions of all matured or even fairly developed codes.

One standard product is so-called weather-proof wire. In its infant years the code for interior wiring contained no "whether" limit for weatherproof. But as the Code developed, even slightly, it became necessary and generally acceptable for the Code to state "whether"

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MANY OF THE difficulties which attend the revision and administration of the code are attributed by some careful thinkers to the over emphasis of "how" things may be installed and the lack of emphasis on "whether" they may be installed and, if so, "where." It is contended that a proper recognition of this triple function of the code would have caused a quick and peaceful decision on the sheathed cable matter; that it would minimize additions to code standards locally; that it would remove much of the conflicting interpretation that exists today. In any event the Electrical Committee is being asked to consider this principle and at the 1927 revision it is not unlikely that the Code will be rewritten in such a way as to more adequately point out "whether" a certain product may be used and if so "where" and in "what way." We must not have another such disgraceful squabble as we have just been through; we must not have so many local diversions from the Code if it be truly a national code; we must have more uniformity of interpretation if the Code is to mean anything. If Mr. Canada gives the electrical industry nothing else than this thinking of his on the triple code functions he will have made a large contribution.—The Editor.

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which first had conscious and organized attention was the electric phase—concerned with determining what is a safe economic electrical type of system; and a constant potential system of presumably low voltage and orderly electrical arrangement, gradually evolved as the determination. But a second phase of this art to have attention and in a much more organized way, was the mechanical phase—largely concerned with determining what are suitable mechanical types of wiring; and this attention resulted in a code of rules and requirements which illustrated to some extent all three of the stated functions for codes—describing, "whether," "where"

such a material can rightly be used within buildings. At first, in 1895, the Code stated, as to "whether" such a material could be used, that it could be used but only "where" exposed to view in dry places. Later, in 1899 the Code ruled, as to "whether," that it could not be used, but in 1903, its use was again permitted "where" corrosive vapors made it more suitable than rubber. Thus for this material the Code early ruled on both "whether" and "where," to the clear guidance of all concerned.

The Code also ruled in its early days and continues to rule as to "whether" and as to "where" wood molding is permitted. It is not permitted for voltages



above 300. It is still permitted in buildings, but not "where" dampness exists or "where" it would be concealed from view. Perhaps some day it will no longer be permitted "whether" the location is wet or dry. Very early in the Code's history (1895) concealed wires were allowed, "where" certain conditions existed, to be "fished on the loop system," to answer the question "whether" knobs and tubes were always to be required for wires in concealed work, or rather, the question "whether" and if so "where" fished wires could be used.

#### "How" Rules

It became also a Code function to rule upon "what way" or "how" given commodities are to be installed, once it has been determined "whether" they may be installed, and "where" they may or may not be installed. Illustrations of "how" rules abound in the Code, and are too familiar to readers to need repetition or emphasis in this statement. In fact some present rules of the Code intermingle their answers to "whether," "where" and "how" in combined rather than separate statements, and thus some of our Code makers have innocently overlooked the necessity for examining practice from all three viewpoints.

As the interior wiring art developed with increasing rapidity and as increasing numbers and types of commodities came under Code provisions, certain questions were raised from time to time as to "whether" other types of wiring than theretofore recognized as suitable should be so recognized. For instance, up to 1897, the Code stated that all wires not encased in wood molding or approved conduit must be on insulators, thus ruling adversely as to "whether" other types of wiring could be used. It is true as above noted, that in certain cases "where" use of insulators was impossible fished wires were permitted. But when other types of wiring came to be proposed in subsequent years, the questions "whether" they might be used, and if so, "where"—were necessarily heard by the Code makers and answered in the Code. Not to mention certain mechanical types of wiring which were once recognized for a certain field of use, but have no longer a recognized field of application, there exist today, and are recognized as suitable "where" given conditions obtain, additional types to those recognized in the 1897

Code such as armored cable, metal surface raceways, etc. And new types will from time to time be suggested.

Today, just as truly as twenty or thirty years ago, the Code's functions include a properly balanced treatment of this "whether," "where," "what way." It is unthinkable that any one person, any one interest, or even any one group should be able to impose upon a public, which so trustingly relies upon its safeguarding by the Code, the use, any "where," of commodities or types of wiring which the Code does not yet recognize as suitable, nor their use "where" the Code does not permit. Equally is it unthinkable that the Code should fail to continue functioning in all these fields of installation standardization for which the public looks with earned confidence to its protection. Who would propose a future cessation of such traditional functioning of the Code? By what motives would such a proposal be initiated or supported? Certainly, if such a proposal were to be made, the public and its selected representatives for Code administration would not only know about it but would have a hand in its consideration before a decision could be made.

#### Analogous Situations

It is true that the Code may or may not be adequately and harmoniously developed to discharge its three functions with equally satisfactory efficiency, but before proceeding briefly with the inquiry as to whether the Code today is well rounded—well balanced—or needs further rounding, in its functional development along these three outstanding lines, let us very briefly examine a few analogous code functioning situations with other codes of practice.

Proceeding by a simple step from inside to outside wiring, it is immediately observable that the property safety involved in outside wiring is not only the building property of individual owners, as with interior wiring, but is also, and more immediately, the wiring property of utilities of various types. Instead of a relatively scattered, incoherent and perhaps unexpressed point of view among individual building property owners as is the case with interior wiring, we should expect in the case of outside wiring a rather more considered policy on the part of each of the various property owners and probably some co-ordination between them, to produce and foster a Code well balanced as to

"whether," "where" and "what way."

"Whether" various types of outside wiring shall, or shall not, be recognized has, in fact, received such a co-ordinated consideration and is determined in the National Electrical Safety Code. Wires in underground cable, overhead cable and overhead open types of construction are all recognized as suitable. "Where" each is suitable is also dealt with. Open wiring is not suitable where space from buildings or from other wires is lacking and considerable space is requisite and specified. Similarly, overhead cable and even underground cable is suitable only where adequate but correspondingly less room is provided. Thus very high voltage open wires will be excluded from narrow alleys while these same wires may not only be allowable in a wide street, but will be a recognized economical, safe method. For each mechanical type of outside wiring there is a clearly defined field ("where") for recognized application. For each type of wiring, "where" permitted, "what way" is also clearly outlined by this Code. It is a three function or complete Code.

Turning to another field—the field of building construction, we find a similar treatment of our three typical code functions. "Whether" a frame or other relatively unsafe type of building is allowed depends on "whether" there is congestion of property and congestion of persons. "Whether" exits and fire escapes are required depends on "whether" people congregate and to what extent above a given degree of congestion. "Whether" a building shall be required to afford ready access as well as exit to people and processes contained therein, is a question pretty well settled in the affirmative and has its not too remote analogy in the field of interior wiring. Shall interior wiring be adequate for the crowd of currents which may be expected to use it? Of course.

#### Requirements Increase

Both exit and entrance requirements increase as the property and life values increase and the hazards of all kinds grow greater. Similarly, for wiring, as property and life values increase in any building, as chances for disturbances increase, and as the building necessarily transcends a merely temporary or wholly private character, types of wiring are today called for which duly



recognize the need for ready exit and entrance of individual wires as their inspection is needed or as the complex demands on wiring vary or as the life of individual wires, economically shorter than the building life, comes to its quicker close. Thus for larger, more populous, longer lived buildings, more subject to occupational changes and to mechanical disturbances of all kinds, types of interior wiring not necessary for certain other buildings, become the safe, economical, suitable types. Each mechanical type of wiring can safely and economically serve a given field, and those who rely upon the Code for guidance need it in this respect, as much as to determine "how" wires shall be installed.

#### Not Overdeveloped

That the Code is not overdeveloped, and perhaps not sufficiently developed, along the "whether" and "where" functioning lines may best be indicated by the number of instances where additions have been made to the National Code in applying it locally, against natural reluctance of the standards-supporting local representatives of nationally organized groups. These local additions become numerous only when the Code fails sufficiently to keep abreast of public needs for guidance in these respects. When local additions become numerous, the art becomes unduly restricted, and expense, tangible or intangible, is added to every wire user and current user. The Code has then become, in a degree, inadequate. True, if all these local additions were, for a given character of building construction and occupancy, closely similar in all localities, the expense would be at a minimum and if the additions are not too burdensome because of their unorderedly origin they can well become, at any time, an addition to the one National Code. How much better, however, to deal outright with the necessary National Code additions, rather than to deal with many separately prepared and inescapably varying guides to "whether" and "where!"

How, as new commodities, new methods are proposed, do they secure orderly consideration and orderly disposition in the National Code? How does the Code function in thus facilitating real progress and in restraining bad tendencies?

A new commodity which clearly falls within a mechanical type of wiring for

which the Code has already defined a suitable safe field for application will naturally offer only minor problems so far as relates to its suitable use. Other minor problems offered by such a new commodity will naturally be as to its physical qualifications for such already defined uses. Such commodities present no major problem.

On the other hand a new commodity which fails to fall within any mechanical type of wiring for which the Code has already defined a suitable field for application, may or may not be suitable for application over part or the whole allowable scope of application of some already recognized type of wiring. There is a truly major problem with such a new commodity. This problem is not as to its physical qualifications nor can these be conclusively determined by themselves and before a suitable field of application has been found and has had its boundaries defined.

The major problem in this case is the fair, impartial, reasonable consideration and decision as to "whether" there is a suitable field for application of such a commodity in the public interest; if so, to decide what field of application ("where")—among various proposed fields, is a conservative trial field for application; and finally, only after these orderly steps have been taken, to finally determine "whether" the physical qualifications of the commodity make it suitable for the designed field of trial application.

#### Trial Fields

Fields of application suitable for various types of wiring have, of course, changed as times, public needs, correlative safeguards, or improvement in particular commodities have permitted. And fields of application will continue to change for the same reasons. A new field of application for a new commodity, being in fact a trial field, may be expected to develop more changes than are necessary, desirable, or indeed economically permissible for older fields of application for older commodities. The public interest, which must determine, is served best by reasonable and orderly progress. No one interest nor any partial group of interests is either qualified or entitled to determine upon vital changes in old fields of application or upon assignment of new fields. Only a fair cross section of the whole public is clothed with sufficient wisdom and authority to acceptably

serve the public in this, the most important field of Code development. Consciousness of this need for the widest representation in such development is rapidly gaining possession of all the cooperative agencies engaged in the great adventure of making our National Electrical Code and keeping it in the way it should go. This is the aim, alike, of the Electrical Committee of the sponsor body, the National Fire Protection Association, and of the American Engineering Standards Committee.

#### Forestall Local Codes

By discharging this responsibility nationally, local attempts to meet the emergency needs for guidance as to choice of types of wiring for given fields of application—to determine "whether" or "where" a commodity or type of wiring may be used—will cease.

If anyone has believed that the National Code does not now concern itself with "whether" and "where" as well as "how"—this belief must result from oversight and overemphasis on the rather too numerous and wildly varying local rule ventures along this line. If any one has believed that the National Code should not concern itself with this "whether" or "where," or should do so only incidentally and slightly—this opinion must be taken as contrary to the principles on which this and other codes have been based, and lead to certain inescapable questions. Shall we then have not one national, but many local codes? Can we properly, safely, or economically restrict a national code to the perhaps minor field of determining "how," while delegating to local jurisdictions the probably major field of determining "whether" and "where," to the probable success of confusion in production, distribution, and of method of installation (how) also? Shall we allow, by default of timely present development in the present Code, a new Code to grow up, dealing with the same art, intertwined and interrelated with the present Code's functions, but separately fostered and dealt with, and treating "whether" and "where" in a clearer—more orderly—more adequate way?

The answer is what the Electragists and other national groups who cooperatively form and develop the National Electrical Code may cooperatively determine, if they proceed to so determine before determination passes to other makers of events. Why not "let THE CODE decide!"

## WHY PRICES VARY

What happened when 67 Contractors figured overhead and selling price from identical figures

**PROBLEM:** An Electragist billed \$20,000 of completed work in previous 12 months. The prime cost, (materials, labor and direct expense,) on these sales was \$13,000. His overhead, (the cost of running his business during these 12 months,) was \$5,000, leaving him a profit of \$2,000.

The coming year he wants to make a profit of 10% on the gross cost of all his jobs. What should be the selling price of a job on which the prime cost is \$100?

HOW THE SELLING PRICE SHOULD BE FIGURED	Dollars	HOW IT WAS FIGURED IN FOUR CITIES			
		City No. 1 Contractors Quoted	City No. 2 Contractors Quoted	City No. 3 Contractors Quoted	City No. 4 Contractors Quoted
Cost of Materials . . . \$40.00 Cost of Labor . . . 55.00 Direct Job Expense . . . 5.00 Prime Cost → \$100.00	100				
	105		1.....107.00		
	110	1.....111.53 2.....112.00		1.....111.00	
	115				
	120	2.....120.00 1.....121.00		1.....120.00	
	125		1.....123.20		
	130	1.....128.00			
	135			1.....130.00	
	140	1.....132.00 2.....135.00 2.....137.50		2.....132.50 1.....136.00 3.....137.50	1.....132.00 2.....136.00 5.....137.50
Prime Cost of Job . . . \$100.00 Add Overhead 38½% . . . 38.50 Total Cost of Job . . . \$138.50	140	4.....140.00			2.....140.00
	145	1.....142.00			1.....143.00
	150	2.....148.50 1.....150.00			1.....146.70 1.....148.50
	155		2.....150.00		
	160	1.....152.35	3.....152.35		2.....152.35
	165	1.....157.00			1.....157.00
	170		1.....160.00		1.....160.00
	175	1.....165.00	1.....165.00		
	180			1.....169.40	
	185		1.....175.00		
	190	1.....185.00			
	195				
	200	1.....200.00	1.....200.00		
Add Profit 10% of \$138.50 . . . \$13.80 Correct Selling Price . . . \$152.35					

Each  
of these  
33  
Men  
Quoted  
Below  
Cost

Correct  
Price

# How You Can Figure Overhead

*One Reason Why Prices Vary on Electrical Bids  
Is Shown in the Story of this Mistake-Proof System  
Tried on Four Groups of Contractors*

By ARTHUR P. PETERSON, Field Representative,  
and LAURENCE W. DAVIS, General Manager,  
Association of Electragists, International

FOR years many articles have been written and cost studies made to place in the hands of the electrical contractors estimating data which would guide them in arriving at a sound basis of costs and a more satisfactory competition. A large proportion of these articles and talks before contractors' meetings have had to do with the overhead cost of doing business, and we have sometimes wondered whether too much emphasis was being placed upon this elementary factor in selling, and whether simple explanations of how to figure overhead were unnecessary.

We are convinced today that no single thing is more needed by the whole fraternity of electrical contractors than a sound understanding of how to add their overhead cost of doing business to each job they sell and then allow something that will really represent a profit on the job. A large percentage of those engaged in the electrical contracting business do not understand the process of computing overhead and how to apply it to the job.

Recently the following simple business statement of the operations of an electrical contractor was placed before 67 contractors in four separate meetings in as many cities:

## 12 MONTHS STATEMENT

Net Sales Billed .....	\$20,000
Cost of Sales:	
Materials .....	\$6,750
Labor .....	6,000
Direct Job Expense....	250
Total Prime Cost of Sales.....	13,000
Gross Margin .....	7,000
Overhead Expense .....	5,000
(Cost of Doing Business)	
Net Profit .....	2,000

This problem was put before them:

*For the coming year this electragist desires to make a profit of 10 percent on the gross cost of all his jobs. What should be the selling price of a job on which the prime cost of labor, material and direct job expense is \$100?*

## Adopt This Formula for Figuring the Selling Price of Your Jobs:

1. Find your "overhead percentage on prime cost," by dividing your total cost of doing business for 12 months by the total prime cost of all jobs sold in that period.
2. Add this percentage to the prime cost (labor, material and job expense) on every job you figure, to arrive at your gross cost of the job.
3. Then mark up this gross cost by whatever percentage for net profit you desire.

Each of the 67 men in the four meetings was given a pad of paper and asked to figure this simple problem and pass in his "bid" at the price at which he believed the job would return to this electragist his proper amount for overhead and the desired profit of 10 percent on the gross cost of labor, material, job expense and overhead cost of doing business.

The results were startling. The following tables shows the actual 67 bids received:

Group 1	Group 2	Group 3	Group 4
111.53	107.00	111.00	132.00
112.00	123.20	120.00	136.00
112.00	137.50	130.00	136.00
120.00	138.50	132.50	137.50
120.00	150.00	132.50	137.50
121.00	150.00	136.00	137.50
128.00	152.35	137.50	137.50
132.00	152.35	137.50	137.50
135.00	152.35	137.50	140.00
135.00	161.00	169.40	140.00
137.50	165.00	208.00	143.00
137.50	175.00		146.70
140.00	203.00		148.50
140.00	210.00		152.35
140.00			152.35
140.00			157.00
142.00			160.00
148.50			
148.50			
150.00			
152.35			
157.00			
165.60			
185.00			
200.00			

These 67 bids range from \$107.00 for the low man to \$210.00 for the high man as the proper price to charge on a job that has a known prime cost for labor, material and job expense of \$100.00. Of these 67 bids, 33 men quoted below the actual cost of material, labor, job expense and overhead; 16 of them allowed for smaller net profits than 10 percent; 13 of them figured their prices so high that they would have made various amounts up to 50 percent net profit if competition would permit them to charge such excessive prices; while only 6 men out of 67 figured exactly the right price to return them their overhead and a net profit of 10 percent on the gross cost of this job.

With this condition facing us it is evident that the primary need for improving competition lies in a clear understanding by every electrical contractor of a simple method for figuring overhead and selling price. The bids quoted above have nothing to do with estimating, they were all figured on the same known cost of \$100; they had nothing to do with lack of good bookkeeping; for a simple statement of business operations for the previous year was known by each man as the basis of figuring the overhead percentage.

## How to Figure Overhead

The gross cost or total cost of any job is the cost of material, labor and direct job expense plus the proportion of the total cost of doing business which that job must share. This proportion of the cost of doing business which that job must share is just as important to include in the gross cost as the cost of labor or material.

In estimating any job the first figure arrived at is the prime cost, or actual cost of labor, material and job expense. To obtain the gross cost, or total cost of the job, this prime cost figure must be increased by the percentage of this

(Continued on Page 32)



# PROGRAM

## 25th Anniversary Convention

### Association of Electragists--International

CEDAR POINT, OHIO, AUGUST 23-27

#### August 23—Monday

- 9:30 A.M. **Electragists Golf Tournament**  
 Plum Brook Country Club, Sandusky  
 J. E. McAuliffe, Chairman Golf Committee  
 (Players must obtain Guest Cards from Committee before playing)  
 Prize Events: Handicap Championship  
                   Kickers' Handicap  
                   Alibi Handicap  
                   Nearest Tee Shot to Pin at Fifth Hole  
 (Luncheon may be had at Club House)

#### August 24—Tuesday

- 9:00 A.M. **Opening of Manufacturers Exhibition**  
 Convention Hall, Cedar Point  
 Exhibition Committee:  
   Wm. G. Campbell, Chairman  
   Samuel A. Chase  
   Dwight R. G. Palmer  
   J. O. Wetherbie  
   Martin J. Wolf  
 Band Concerts in Exhibition Hall during Exhibition Hours—Macks 10-piece Band.  
 (Daily: 9:00-10:00 A.M.; 11:30 A.M.-12:15 P.M.; 1:30-2:30 P.M.; 4:30 P.M.-5:30 P.M.)

10:00 A.M. **A.E.I. Executive Committee Meeting**

- 10:00 A.M. **Joint Session of State Associations**  
 Convention Hall: Discussions conducted by  
 Arthur L. Abbott, Technical Director, A.E.I.  
**"Estimating House Wiring and Small Work"**  
 Small Exposed Rigid Jobs —Example  
 Exposed Armored Cable Work — "  
 Metal Molding Work — "  
 House Wiring: Use of Manual Data,  
   How to check Units and Correct to meet actual local conditions  
 Job Cost Records  
 Importance; methods of keeping

2:30 P.M. **Group Meetings of State Associations**

3:30 P.M. **Conference of State and Local Secretaries**

- Committee in Charge:**  
 Arthur P. Peterson, Field Man, A. E. I.  
 Charles E. James, Florida State Association  
 M. G. Sellers, Pennsylvania State Association  
 C. J. Geisbush, California Electragists  
 J. Walter Collins, Chicago Association  
 N. J. Biddle, Detroit Association  
 R. H. Grobe, Milwaukee Association

8:30 P.M. **Dancing in Coliseum**

All Entertainment Features under direction of Glad Hand Committee

- Samuel A. Chase, Chairman  
 Tom H. Bibber, Chicago  
 J. J. Caddigan, Boston  
 J. Walter Collins, Chicago  
 Jesse James, Fort Pierce  
 Hugo Tollner, Brooklyn  
 Chas. M. Beltzhoover, Cincinnati  
 Tom F. Hatfield, Indianapolis  
 Walter H. Murbach, Sandusky  
 O. A. Robins, Columbus

#### August 25—Wednesday

- 10:00 A.M. **25th Anniversary Convention (Formal Opening)**  
 Appointment of Special Committees  
 Address: "Survey of Electragist Relationships"  
   Joseph A. Fowler, President Association of Electragists, Int.  
 Address: "An Industry Message"  
   Gerard Swope, President General Electric Company  
 Award of 1926 "James H. McGraw Contractor-Dealer Medal"  
   Earl E. Whitehorne, Commercial Editor, "Electrical World"  
 2:30 P.M. **"An Electrical Department Store"**  
   G. Fred Laube, President Laube Electric Corporation, Rochester  
 (A practical discussion of electrical merchandising by a successful electragist)  
 Discussion by delegates  
**"Trade Policy Trends and Effects"**  
   W. Creighton Peet, Chairman A.E.I. Trade Policy Committee  
 Discussion by delegates  
 4:30 P.M. **Sectional Meetings: Union Shop Section**  
                   **Open Shop Section**  
 8:30 P.M. **Mardi Gras Dance in Coliseum**

#### August 26—Thursday

- 10:00 A.M. **"Job Control and Measurement of Labor Efficiency through the use of Graphic Charts"**  
   Walter H. Taverner, President Walter H. Taverner Corporation, New York  
**"Post Mortems and Their Application"**  
   O. F. Wadleigh, Sanborn Elec. Company, Indianapolis  
 2:30 P.M. **"Labor Data on High Tension Transformer Vaults"**  
   Harry C. Turnock, Hatfield Electric Co., Cleveland  
**"Practical Application of the Electragist System of Estimating"**  
   C. J. Geisbush, Executive Secretary, California Electragists, Southern Division, Los Angeles  
**"A Method of Collecting Labor Cost Data on a Large Job"**  
   J. H. Schumacher, President Schumacher-Gray Co., Ltd., Winnipeg, Chairman A.E.I. Cost Data Committee  
**"New Developments of Estimating Data"**  
   Arthur L. Abbott, Technical Director, A.E.I.

- 7:30 P.M. **Twenty-Fifth Anniversary Banquet**  
 Special Entertainment Features  
 Anniversary Souvenirs for Ladies  
 Music by Macks Orchestra

#### August 27—Friday

- 10:00 A.M. **Symposium: Should there be set up "An Electragist Standard for Wiring Installations?"**  
**Symposium: Is State or Municipal Licensing of Electrical Contractors Needed? What form?**  
 Discussion of these important questions open to all electragists, with recommendations for action  
 New Business—Suggestions by Members  
 Resolutions Committee Report  
 Adjournment  
 2:30 P.M. **A.E.I. Executive Committee Meeting**

# Cedar Point Program Worthy of Anniversary Convention

*National Meeting to be Preceded by Joint Convention of State Associations—Discussion of Technical Subjects Will be Given a Full Day*

A PROGRAM worthy of the occasion has been arranged for the twenty-sixth annual convention of the Association of Electragists, International, at Cedar Point, Sandusky, Ohio, August 23-27. The meeting marks the completion of a quarter century of existence for the association and the subjects which will come up for discussion will demonstrate how far the science of electrical contracting has advanced since the first convention in Buffalo in 1901.

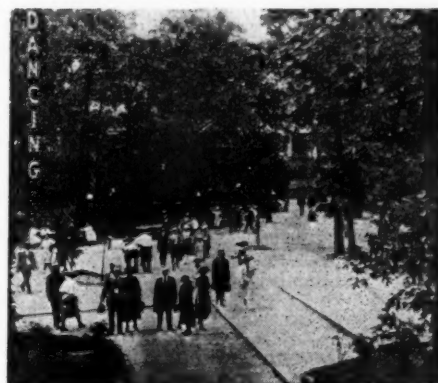
Of particular interest are the technical sessions, one of which will be conducted at the joint session of the state associations, the subject being, "Estimating House Wiring and Small Work." The other session, on August 26, will take up the entire day with papers and discussion on "Job Control and Measurement of Labor Efficiency Through Graphic Charts," "Post Mortems and Their Application," "Labor Data on High Tension Transformer Vaults," "The Practical Application of the Electragist System of Estimating," "A Method of Collecting Labor Data on a Large Job," and "New Developments of Estimating Data."

On Monday, August 23, will be held the annual golf tournament of the association on the course of the Plum Brook Country Club. This will be the only organized sport during the convention, since the location of the meeting offers so many forms of recreation, such as swimming, boating and fishing.

An event of real importance to the contractor-dealer will be the opening of the Manufacturers' Exhibit in the convention hall on Tuesday morning. The committee of manufacturers in charge of the exhibit has worked hard this year to prepare one of the finest convention shows that the electragist has ever had a chance to see. In all about forty manufacturers will display their products in the booths which line the walls and form the aisles of the convention hall and their displays will comprise every new development that has taken place in the wiring and appliance fields in the last year.

The list includes: Wire and cable, armored cable, conduit, conduit fittings, porcelain fittings and products, asbestos products, switches, switchboards, boxes, fuses, expansion bolts, rubber tape, lighting equipment and new units, window lighting equipment, porcelain lighting units, glassware, iron posts and brackets, portable and desk lamps, radio equipment, appliances and household units, fans and motors and steel stock room cabinets and racks.

Formal opening of the convention itself will not take place until Wednesday morning, August 25. President Fowler will preside and deliver a talk on "A Survey of Electragist Relationships." This will be followed by the address of Gerard Swope, president of the General Electric Company, and the award of the "James H. McGraw Contractor-Dealer



In Front of the Coliseum

Medal" by Earl E. Whitehorne. That afternoon will be devoted to merchandising, with a talk by G. Fred Laube on that subject, and to trade policy, with W. Creighton Peet conducting the discussion on the latter subject.

Delegates to this convention will be glad to know that the entertainment features are again to be in charge of the famous Glad Hand Committee, which has officiated so well at past meetings, under the chairmanship of Samuel Adams Chase and with the same members as in past years. What they have in store for the members they have not disclosed, with the exception of dancing every evening on one of the finest dance floors in the Middle West. There will be a Mardi Gras Dance in the Coliseum on Wednesday night and the following night there will be given the first annual banquet held by the association in three years. Souvenirs for the ladies will be provided and the music will be by Macks Orchestra, which has been retained by the manufacturers' committee to supply the music during the whole meeting.

In previous issues it has been shown that Cedar Point offers an unusual opportunity to combine both vacation and attendance at the convention, because of its reputation as a summer resort. How inexpensive such a vacation would be is



Automobile Entrance to Cedar Point from Sandusky—Cleveland Highway



indicated by the following schedule of hotel rates which will be in force during the week of the meeting:

#### THE BREAKERS

Rooms without Bath:		Rates
Two persons in a room.. (each)	\$1.25 per day	
One person in a room.....	2.00 per day	
(Majority of the rooms at this rate)		
Two persons in a room.. (each)	\$1.75 per day	
One person in a room.....	2.50 per day	
(Large number of rooms at this rate)		
Two persons in a room.. (each)	\$2.25 per day	
One person in a room.....	3.50 per day	
(Limited number of rooms at this rate)		
Rooms with Bath:		
Two persons in a room..... (each)	\$2.75	
	and 3.25	
One person.....	\$4.00 and \$4.50 per day	

#### NEW BON-AIR ANNEX

(connecting with The Breakers)

All Rooms with Bath and Twin Beds:	
\$5.00 Single	\$7.00 Double
(Large number of rooms at this rate)	
\$6.00 Single	\$9.00 Double
(Majority of rooms at this rate)	
Large Corner Rooms:	
\$12.00 per day double	
(Limited number of rooms at this rate)	

Owing to the large attendance expected at the convention, it is advisable that reservations be made at once, if those who expect to attend have not already made their arrangements. Reservations should be sent directly to the management of the Breakers Hotel, Cedar Point, Ohio.

## How You Can Figure Overhead

(Continued from Page 29)

prime cost which the total cost of doing business bears to the total prime cost of all the sales made in a 12 months period.

This percentage is known as the overhead percentage on prime cost.

Applying this method to the electricists' business statement shown herewith, the overhead expense for the 12 months period (\$5,000) is divided by the total prime cost of sales for that period (\$13,000), which gives a result of 0.3846, or approximately 38½ percent. The overhead percentage on prime cost of this business therefore should be figured as 38½ percent.

To obtain the gross cost of each job the estimated, or known, prime cost of labor, material and job expense must therefore be increased by 38½ percent.

Adding 38½ percent to the prime cost of \$100 in the problem given to the 67 contractors quoted we find the gross cost, or total cost of that job would be \$138.50.

Since a net profit of 10 percent on the gross cost of all sales is desired, it is a simple matter to add 10 percent to this \$138.50 or \$13.85, giving a result of \$152.35 as the correct selling price.

It will be noted that the net profit of \$13.85 is not 10 percent of the selling price, but 10 percent of the gross cost of the job. If 10 percent of the selling price was desired, it would be necessary to add slightly over 11 percent to the gross cost to produce exactly 10 percent on the selling price.

## BOOK REVIEWS

### Signal Wiring

By Terrell Croft. Published by McGraw-Hill Book Company, New York. 349 pages, price \$3.00.

Lighting and power distribution systems, illumination, even the essentials of A. C. theory and practice are today quite well understood by the average contractor, and by the better class of mechanics as well; but very few could qualify if called upon for a complete theoretical and practical discussion of the installation of a school-house program bell system, though this is a common and simple problem.

Much of "Signal Wiring" is filled with diagrams of signalling circuits. The sections of bells, annunciators and burglar alarms show all the familiar circuits and many not so well known. Nurses' call systems of four makes are shown in diagrams. All nurses' call systems are fundamentally the same; a typical diagram with a brief explanation would have been valuable here. Complete apparatus and assembly diagrams are shown for one clock system with time recorder, time stamps and secondary clocks. Watchman's register systems are omitted entirely.

Other divisions show circuits for industrial signal systems, telephone, fire alarms, police calls, power stations, signalling, pressure alarms, elevators, mine and railway signals and miscellaneous signal systems.

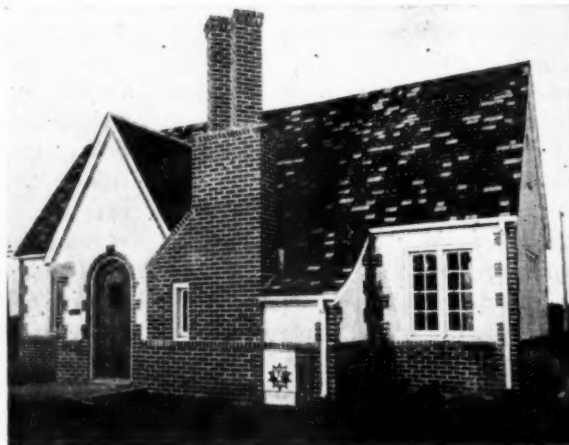
Throughout the book considerable space is given to home-made signalling devices of various kinds. It is difficult to see any practical value in these "kinks."

Some notes in explanation of the apparatus and systems illustrated would have added greatly to the value of the book. The chapter on "Signal Wiring Methods" is exceedingly good; the only fault to be found with this section is that there is not more of it.

## Denver's Fourth Home Electric is Red Seal

Featured as the first Red Seal electric home to be publicly displayed in the territory, Denver's fourth electrical home was visited by 5,317 adults during an exhibition which lasted eight days, starting May 27.

The demonstration was a part of the annual program of the Electrical League of Colorado and provided an excellent opportunity for the public to grasp the significance of the Red Seal plan of electrical installation for residences. Twenty-five hundred Red Seal consumer booklets, obtained from the Society for Electrical Development, were discriminately passed out to visitors and particular reference was made to the fact that the



home had been wired in strict conformance with the Red Seal specifications. None voiced the opinion that the plan was an extravagant one, according to George Bakewell, representative of the league, but everyone seemed to be in sympathy with the system and many went out of their way to express their approval of the adequate electrical specifications which did not border on extravagance.



# THE DIFFERENCE

## between 25 years ago and

# TODAY

As Told to THE ELECTRAGIST

By CHARLES L. EIDLITZ

AT first glance it seems easy to name certain definite changes of importance that have taken place in electrical contracting in the twenty-five years since the electrical contractors' national association was founded. But when you think it over, there haven't been very many changes and the ones that have occurred haven't been so important.

The man who went into the business in 1901 could do it over again and make a success by using the same methods he did a quarter of a century ago. The important elements of electrical contracting are the same as they have always been, and it is still the best business in the United States or in the world.

Minor causes, however, often enough account for major disasters, which in the case of an electrical contractor consists of owing more than he can hope to pay. One of these minor causes is the attempt to combine merchandising with contracting.

Just why a contractor should be expected to turn himself into a retailer is something I fail to see. Presumably a man who goes into the contracting business does so because he has a turn for mechanics, likes to build things and gets a kick out of creating a good job out of a set of specifications and a lot of miscellaneous materials. That's what he is fitted for or he wouldn't be a success at it.

He isn't a retail salesman or that is probably what he would have gone out for in the beginning. But somebody comes along and, without rhyme or reason, tells him he ought to be selling electrical appliances. The fact that he doesn't know anything about selling them and doesn't particularly care about it doesn't cut any ice. He's an electrical contractor; therefore he ought to tie up a lot of money in merchandise because someone back along the



Charles L. Eidlitz needs little introduction to anyone in the electrical industry in New York City or throughout the United States. He entered the electrical contracting business in 1886, was instrumental in forming the National Association of Electrical Contractors and Dealers, now the Association of Electricians, International, and served as its first president. Fourteen years ago he retired from active work as an electrical contractor and later became associated with the Electrical Board of Trade of New York, of which he is chairman of the board of governors. In this position he has become known for his clear thinking on the affairs and problems of the electrical industry.—The Editor.

line thinks the contractor can also be a retailer.

There is a diagram I have been using a number of years that will illustrate what is meant here. Imagine a tank with a capacity of thousands of millions of gallons! That tank contains "Opportunity" and all along the lower edge are a great number of spigots, one for each man who goes through life. Each of us is given a pail and set to watch our spigot, the flow from which is

controlled by a ball fitting into a cup on the inside of the tank. A string is attached to each of the balls and all the strings are in the grasp of an invisible power. This power pulls the string for each of us just twice in our lives and if we aren't there, ready with our pails, then our "Opportunity" spills out on the ground and is lost for good.

Now if we are set to watch a spigot labeled "Electrical Contracting," we're going to lose our opportunity when it comes if we have wandered off to see how Bill Jones is doing at the spigot marked "Electrical Merchandising."

If this needs proving, I want to know in return of a single case where a successful electrical contractor has failed to continue his success by sticking to contracting. Then I would like to have some figures on the number of firms that have tried to make a go of contracting and merchandising and have gone broke.

There is one of the minor changes I have referred to. Twenty-five years ago an electrical contractor was a contractor and nothing else. Today a lot of contractors are trying to handle everything from boudoir lamps to rotary converters and are making a bust of it.

Another change has come about through the efforts of many contractors to make their stockrooms look like a jobber's warehouse on a small scale. Why should any contractor carry a big stock or any stock at all if he is a good enough business man to maintain the right relations with his jobbers. It's expensive and unnecessary. Years ago a lot of contractors, as well as myself, did yearly volumes running close to a million dollars apiece with stockrooms containing probably half a dozen rolls of tape, some solder and some paste. We had accounts with every jobber in town and we kept on good terms with all of them by paying our bills without a kick, so we could get deliveries of

anything we wanted any time we wanted it. It cost more to buy in small quantities. But when you figure that we didn't have any cartage to pay, no rent for storage space, no paper work to keep track of supplies and no stock-keeper drawing pay for dozing against a bin-three-quarters of the day, it ought to be easy to see how we saved money by spending a little.

#### Excess Material

The real angle on filling a storehouse to the ceiling with material we may be going to need next Fourth of July lies in the relation of the contractor to his client. Every contractor likes to be regarded as a consultant and nobody can be a consultant when he has a personal interest in seeing that O'Keefe & Smith motors go on a certain job. Suppose the owner wants to know what kind of panelboards ought to go in and suppose at the same time the contractor has a lot of panelboards of a certain make in his stockroom! Is it human nature to recommend some other manufacturer's product? No, not any of the human nature that you find outside of the Lives of the Martyrs. And if the architect has suggested 7½ h.p. motors when the contractor has a lot of 5 h.p. motors in stock, what usually goes in? The five h.p. motors nine times out of ten. That's the worst feature that this change in stock-keeping habits has brought about—the feeling that the contractor has a greater responsibility to himself than he has to his client.

The biggest change of all, though, is not in the contractor's work—it's in the contractor himself. In the days when we first got together and started a national association, the contractor's horizon was bounded by the suburbs of the town he did business in, and sometimes it didn't even do that much commuting. That was true, in a lesser degree, even of the New York contractors. Nobody knew very much about the kind of work being done outside their city or the kind of men who were doing it. So much time has gone by since then that it's all right now to admit we were surprised to find out what nice fellows there were in the contracting business in Cleveland and Peoria and San Francisco. Why, they were just as fine men as we had in New York City!

One of the important reasons—the most important it always seemed to me—for starting the national association was to broaden the vision of the con-

tractor. It accomplished a good many more things than that but if it had been successful only in that, there would have been enough reason for its existence. Within a few years after the first meeting in Buffalo there wasn't any difference between the viewpoint of the successful contractor in Maine, in Illinois and in California. Each one had begun to realize that his problems were common to the rest of his fellow business men and all of them from having a local outlook had come to have one that was national.

Twenty-five years ago a visit to New York was the event of a lifetime to most contractors from small towns. Nowadays a trip to the East is just a matter of course and big construction projects fail to awe the visitor. He sees them just as big in his home town.

Probably it is because of this broader outlook that the electrical contractor is coming into his own on industrial work. Before the war practically all the big industrial plants had their own maintenance forces. Today it is just the other way around.

#### The Future

Not satisfied with cross-examining me about the past twenty-five winters and summers, the editors ask me to go on record about the changes necessary to make electrical contracting a bigger and better business. I'm not a prophet—anyhow I want to retain a little honor in my home town—but I'll hazard an opinion. Electrical contracting won't see many changes in the next two and a half decades and it doesn't need to be changed. Right now it's the best business in the country or in the world, as I said at the beginning. This, despite the groans and lamentations of many contractors that "the electrical game is going to the dogs." If somebody will discover a business that is easier to enter, gives a bigger return on the investment and a greater net profit on a small volume of business, I'd like to enter that field myself.

Here is an average case of what I mean. About 1914 a young fellow of my acquaintance, a foreman for an electrical concern, came to me and said he'd like to get into the business on his own.

"What's to stop you?" I wanted to know.

"Well, I've only got seven hundred dollars and I don't know if that's enough to swing the contract I can get to start with."

I told him to go ahead and if he needed a few thousand to carry him over he could count on getting it from me. Three weeks later he borrowed a thousand dollars, which he paid back in the course of time. That made an original capital of \$1,700, most of which covered the payroll, while some jobber carried him on the material.

A couple of months ago, after a meeting of the contractors' section of the New York Electrical Board of Trade, I heard this same man talking in a group, the effect of the conversation being that contracting was a rotten business and a man was a fool to stay in it. A few minutes later he mentioned that he had just completed a home up in Westchester County. He had planned to put \$40,000 into it and had ended, by spending \$65,000, and had no mortgage on it. Now that's what I call interesting, when a man can start with \$1,700, a thousand of it borrowed, and inside of twelve years put by enough to build himself a house that stands him \$65,000 before he eats his first meal in it. I know plenty of men that are looked up to as prosperous citizens, who do not manage to get together that much cash in thirty years of hard work.

For the third time I declare that to the best of my knowledge and belief electrical contracting is the finest business to get into and stay in that anybody can find. As for real changes in it during the next twenty-five years, I hope nobody puts any alterations across. My motto is to let well enough alone when well enough is mighty fine.

#### Labor on Armored Cable

In an article published in the July issue under the title, "Labor Records on Apartment House Armored Cable Installation," the word "Feet" was inserted by mistake in the headings of Tables C, D, E, F, and J. This was misleading since in some cases the quantities were feet while in others they were not. The note in italics on page 29, reading, "Actual time, 29 hours or 90 percent of computed time," refers to Table I.

The second paragraph in the third column on the same page refers to Table H and in the same column under the heading, "Bell Work and Letter-boxes," the time on No. 19 twisted pair should have been stated as 9.1 hours per 1,000 feet, instead of per 100 feet.



# Chats on the National Electrical Code

*A Monthly Discussion of Wiring Practice and Questions of Interpretation,  
Presented with a View Toward Encouraging a Better Understanding of the In-  
dustry's Most Important Set of Rules*

By J. C. FORSYTH

Supervising Engineer, Bureau of Electricity, N. Y. Board of Fire Underwriters

AFTER a lapse of more than a year THE ELECTRICALIST resumes this department because of the urgent demand of readers for a section where code matters might be discussed informally and where no attempt would be made to render authoritative interpretations. It has been our good fortune to secure J. C. Forsyth, supervising engineer of the Bureau of Electricity of the New York Board of Fire Underwriters, as conductor of this section. Mr. Forsyth has been a member of the Electrical Committee virtually from the beginning and has taken a leading part in bringing the National Elec-

trical Code up to its present high standard. He is chairman of Article 8 Committee, which committee will have some exceptionally important work to undertake for the 1927 revision.

We want our readers to feel free to ask any questions relating to the Code, not for the purpose of securing interpretations to confound the local inspection authorities but in order that an appreciation of the true significance of the many sections of the Code may be had.

—THE EDITOR.

## Supplying More Than One Building from Single Service

In taking up this line of "Chat" it would seem expedient to start at the beginning and follow the equipment through from the "Service Lines" to current consuming or translating devices.

There appears to be some misunderstanding as to the real meaning of the requirements under Article 4 of the National Electrical Code. This Article has to do with services and service construction only. 401-A prohibits the interconnection of two or more services in a building when such connection would form a "shunt around any street fuse or switch." Should such a condition exist a flow of current might be set up that would burn out the meters and overload the service lines.

It appears to be quite a fad at present for the owner or lessee of a building to purchase current from the lighting company and resell it to tenants, measuring the amount of electricity used by separate meters.

There is no objection from an inspection standpoint to this practice unless an attempt is made to connect two or more buildings to one source of supply, thereby carrying the service conductors through party walls from building to building. It has always been held that this is an undesirable practice for three reasons:

First, it places the control of the lighting and power system of the building supplied under the control of the

occupants of adjoining property. It also prevents the purchaser of current from having complete control of his own equipment and access to the point of supply.

Second, it introduces an electrical hazard in a building which is unnecessary in so far as the supply of current to that building is concerned.

Third, it is often difficult to fully restore the party walls to their original condition in the matter of preventing fire and smoke from one building gaining access to adjoining property.

In all cases special permission should be obtained before starting such interbuilding services as is required under Section 3 of 401.

Ordinarily all such interbuilding connections are required to be buried under two inches of brick or concrete from point of service connection to the building served.

## What Constitutes Service Equipment

All service wires and conduits should be brought into a building from either underground or overhead lines at a point where the service switch and fuses can be properly located and where they will be readily accessible to the owner or occupant of the building and to the supplying company. The requirement of fuse protection and switch control at service entrance is important due to the fact that between these protective devices and supplying lines there is no

protection and, therefore, in case of short circuit or ground the conductors and quite frequently conduits are completely destroyed.

The question as to whether an interbuilding supply line constitutes a service equipment in the meaning of Article 4 is one regarding which there is considerable difference of opinion. Some claim that this line should be regarded as a separate service and rules pertaining to service supply be made applicable to it; while others contend that if this service line is protected by fuses and controlled by a main service switch at the point of street connection it should not be regarded as a service but be accepted under the same conditions as any other line carrying an equal volume of current. It would be interesting to receive opinions from contractors and others in reference to this matter.

## Diversity Factor

After passing the service switch one of the most important questions which always arises is whether or not consideration should be given to the matter of "Diversity Factor." This is a much discussed problem and is now pending before the Committee on Article 8 of the National Electrical Code.

The question of conductor sizes for motors is also receiving much consideration at present. Contractors and others are continually asking for some

information as to the proper size of wire for a given size of motor.

For the present the Code does not specify wire sizes in relation to connected loads of any kind. The Code simply tells us that when the amperes to be carried are known, the size of the conductor to carry that current must not be less than that given in the table.

Many inspection departments have worked out tables of their own and put them into effect with more or less satisfactory results. There are so many factors, however, which enter into such calculations as to make it extremely cumbersome to show just what should be done under all conditions of service.

For illustration, in looking over one of the local sets of requirements above referred to I find that there are eighteen tables for motor wiring alone, occupying seventeen full pages of the publication and at that the subject is only partially covered. It might be possible and perhaps profitable to insert about eighteen more tables of the same kind, giving desirable information as to the allowable sizes of conductors, switches, fuses, conduits, etc. Additional tables might be prepared, giving the resistance losses in conductors for D. C. motors and both the resistance and inductance losses for A. C. motor circuits. A sufficient number and variety of tables could be compiled that would answer any question which might arise regarding motor installations. Such a comprehensive set of tables would enable anyone who could read and apply them to install power equipments.

But why not allow the contractor to exercise his engineering ability and determine for himself and his client the question as to what is or is not the proper and necessary amount of copper to provide for a given condition. This is largely as it exists today and as I believe it should be. Contractors who are unable to determine all of the required data for themselves, especially with all of the published information available regarding such matters should not set themselves up as "power" engineers. But there are many in the electrical contracting business today who either will not take the trouble or who have not the ability to make the necessary calculations so that we have the demands made upon the Electrical Committee for "Tables" giving this, that and the other information.

Why not prepare some general for-

mula that will cover the principal conditions and by which calculations can be made? It would certainly be much less involved and would require of those using them to have some knowledge of the subject in order to make proper application of them. Perhaps a few general tables might be advantageous and even desirable, but it does seem as if any attempt to cover the entire range of electrical conditions in this way would result only in confusion and misunderstanding. There are a number of important factors not usually taken into account in the make up of the average tables, such as: The distance between the point of current supply and the motor; the inductance losses in A. C. motor circuits; the power factor of the motor; the conditions under which the motor is required to start; and the character of motor load. Of course, these may all be approximated, but if we are intent on accuracy and reducing the installation costs as much as possible they should be considered in each case.

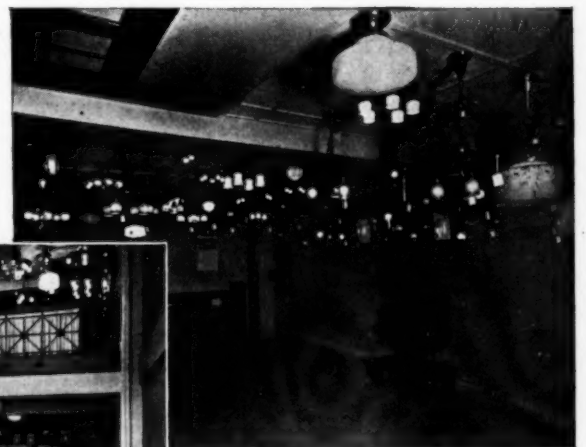
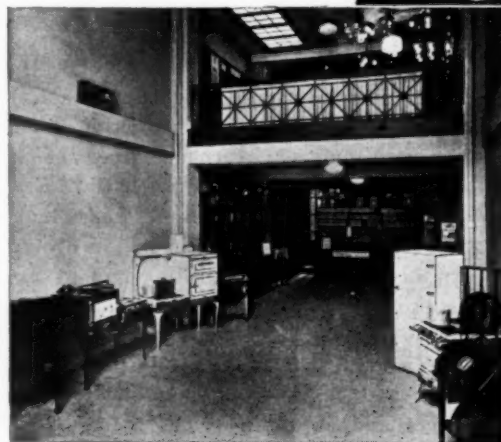
When, however, we come to the question of "Diversity Factor" in the mains or feeders supplying a group of motors then we have an entirely different proposition. There is no question but that the final circuit supplying a motor should and must have sufficient copper to safely carry the current required at

the peak load. Let us for illustration take the most common example: that of a number of elevator motors connected to a single riser. This type of service usually requires large starting currents. Should the inspection department demand copper equal to the total starting currents for all motors; the running current for all motors plus the starting current for one half, one third, or one quarter of the motors; or just the running current of all motors; or should the conditions of operation be taken into consideration and possibly allow a load factor of 90%, 80%, or even of 60% of the total running load? Instances can be cited where 50% of the running current of a group of motors was more than adequate for the heaviest demand upon them.

In these days when it is customary to operate each piece of machinery by an individual motor, it is unquestionably proper that some consideration be given to the demand factor. Can this demand factor be tabulated for all different forms of industrial service and results arrived at with sufficient accuracy to prevent undue loading in one case or excess cost in another? Has sufficient data been secured to warrant the adoption of such tables? If any information of this sort is available I am sure that the committee now studying this subject will be very grateful to receive it.

## Carefully Planned Electrical Store

The Smith Electric Company, Evansville, Ind., recently moved into these new quarters. Below is shown the attractive appliance display room.



The spacious fixture display room, illustrated above, is on the second floor. It will be noted that though there are plenty of fixtures shown, the room nevertheless retains its clean appearance.



# Savings Through Job Management

## CHAPTER I

### The Foreman's Job Efficient Superintendents

### Workmen's Tools Incentives for the Men

#### Facts for Foremen

By M. S. MacNAUGHT

THE production phase of an electrical contractor's business presents more difficulties than the corresponding situation in other lines, due largely to the existence of several crews of workmen, operating wholly detached from each other, and without the constant direct supervision of a regular executive. In factories, attention is directed toward the production of a comparatively few articles and these in great quantities so that working conditions today duplicate those of yesterday, and efficiency methods can be accurately developed. Not so with the electrical contractor. Each job is special, differing from every other and operations are almost never continuous; that is, men run pipe one day; pull in wire a week later; and hang fixtures shortly thereafter, with the result that except on rather large jobs, specialized work does not exist.

#### Production Methods

Production methods, so far as the electrician is concerned, must have for an aim the management of men and material so that, here and there throughout every job, savings will be made which would otherwise be overlooked. In days of bitter competition, these little savings may mean the difference between victory and defeat.

Production on a construction project requires principally proper labor management, with capable handling of material as a less important factor.

Since efficient labor is the most vital cog in production methods, the ways and means of attaining such efficiency are given more attention in this article than the ordering and delivery of material, or its installation.

The problem, briefly stated, is to assemble working crews of high grade

workmen, under expert foremen, with a real superintendent in charge of all.

#### The Foreman's Job

Of the duties devolving upon the superintendent, none is more directly his own function than the choice of men, their assignment to jobs, and their judicious management. A principal problem is the selection of foreman. The workman who is chosen to manage a construction crew should obviously be hand picked, from the contractor's own force if possible, and in any case should have the confidence of the superintendent.

A foreman worthy of the name is not merely a good workman, but also a capable handler of the mechanical type of worker, with a disposition which enables him to mix readily with the foremen of other trades on the job, and with marked ability as a planner and executive. As a crowning virtue, he should be willing to work hard, and even dirty his hands despite his elevated position.

All too often a foreman gets the idea that he is above manual labor, and the contractor finds him spending his whole time bossing his employees. However, except at the peak of a big job, there are many occasions when the presence of a real working foreman on a project means dollars in the contractor's pocket. At the start of every job, very little work needs to be done, often barely enough to keep one man going. If the foreman chosen is of the type that will not pitch in and do hard work, a journeyman must be put on at the very beginning—obviously an unnecessary additional expense.

Once a foreman is assigned to a project no change, as a rule, should be made. The knowledge of job conditions

which a foreman acquires as a building progresses is very detailed, and represents a certain cash investment by the contractor. If he is shifted, a new man must learn all over again, perhaps making costly mistakes, and in any case, inevitably slowing down the work for a time. Continuity of work, excellence of the final job, and maximum efficiency demand one man at the helm from beginning to end—except in the case where a good roughing-in foreman is replaced near the finish by an expert in completing special installations. More about that later.

#### Efficient Superintendents

The assignment of men calls for particular caution on the part of the superintendent. Every minute a man is on the pay roll costs money. If five men can do a job, it is needless waste to use six; yet this uneconomic condition exists very often in the construction field. Especially in the case of concrete construction, the crew may be rushed one day, when "mud" is being poured, and the sweating foreman may send a hurry call for more men. While it should be realized that help is sometimes really needed, more often, if the crew is not increased in size the men already on the job will find a way to get the work done—result, a moderate saving in labor cost. The superintendent should know existing conditions on every job, so that if a call comes in for more men which he knows is needless he can simply forget to send the extra workers.

In other words, men must be kept busy if money is to be made under modern contracting conditions. Work in sufficient quantity must always be kept ahead of every workman, for otherwise they will slow down and kill

time. The minute too many men are on one crew, a shift should be made, or the surplus laid off until they are really needed again.

The superintendent, of all men in the executive branch of the business, is the best qualified to carry the weight of details pertaining to various jobs, and if the right type of man is chosen, he will conscientiously pay attention to every special phase of the work. It is his duty, for instance, to tell the purchasing agent when cabinets should reach the job, and if they do not arrive on schedule, to notify the purchaser.

#### Careless Superintendents

No one else knows the problems facing the foreman out on the job. No one else has such a good opportunity to foresee special conditions and provide for them. No one else can judge just what is the most economical time for material to arrive. Therefore such details should be willingly shouldered by the superintendent, on every job.

Some superintendents make cursory inspections of each job, then spend the middle of the day at a ball game, or a moving picture, returning to the office in the late afternoon for just a few minutes. Such a man is wasting time he owes his employer, time during which he should be studying over plans, thinking out methods to shorten the work, save material and economize on labor.

There is no man living who can glance at a set of plans and see all the possibilities for saving. Successful planning of work requires a great deal of study over the plans of every job, and very often some way to save real money is developed only after many hours of searching. Such being the case, a superintendent can profitably spend hours otherwise wasted, perusing the working drawings.

The superintendent with a good knowledge of the conditions out on construction is an invaluable aid to the purchasing department; he can check over shop drawings sent in for approval, offer helpful criticism of material ordered, such as boxes, fittings, etc. He is in an excellent position to observe the use of new tools or appliances and should invariably give new devices of apparent merit a tryout, reporting definitely whether they are valuable for use by his company.

New tools are constantly being produced, many of them of more or less

#### What Every Wireman's List Should Contain

- |  |                                      |
|--|--------------------------------------|
| 1 ratchet bit brace, 10 inch swing.    | 1 combination square.                |
| 1 hand drill.                          | 1 center punch.                      |
| 1 6 ft. folding rule.                  | 1 pocket knife.                      |
| 1 claw hammer. Straight claw.          | 1 plumb bob and line.                |
| 1 adjustable hack saw frame.           | 1 wood chisel, 1/4-inch.             |
| 1 blow torch.                          | 1 wood chisel, 3/4-inch.             |
| 1 compass saw.                         | 2 or 3 small star drills.            |
| 1 bit extension, 15 inch.              | 2 or 3 small cold chisels.           |
| 1 10-inch pipe wrench.                 | 1 tap wrench.                        |
| 1 14-inch pipe wrench.                 | Taps 4/32, 6/32, 8/32, 10/32, 10/24, |
| 1 screw driver, 2 1/2-inch blade.      | 12/24, 14/20.                        |
| 1 screw driver, 6 or 8-inch blade.     | Assortment of sharp twist drills.    |
| 1 screw driver, 12-inch blade, narrow. | Bits (Mephisto) 5/16, 10/16, 11/16,  |
| 1 side cutting plier, 7-inch.          | 15/16.                               |
| 1 gas plier.                           | 1 expansive bit.                     |
| 1 round nose plier.                    | 1 test lamp.                         |
| 1 half round file, 10-inch.            | Solder and tape.                     |
| 1 pipe reamer.                         | Compound, paste.                     |

#### As a supplementary list of desirable tools, these might be added:

- |                              |                                     |
|------------------------------|-------------------------------------|
| 1 50-ft. tape.               | 1 set socket wrenches.              |
| 2 heavy floor chisels.       | 1 speed indicator.                  |
| 1 short rip bar.             | 1 nail set.                         |
| Assorted wood chisels.       | 1 tinsmiths' shears.                |
| Assorted small fine files.   | 1 gasoline torch.                   |
| Chain pliers.                | 1 polarity indicator.               |
| Diagonal pliers.             | Calipers, inside and outside.       |
| Assorted fine screw drivers. | 1 feeler bit.                       |
| 1 hack saw.                  | 1 putty knife.                      |
| 1 wood saw.                  | 1 small trowel.                     |
| 1 mitre box.                 | 1 small box water colors.           |
| 1 wire gauge.                | Assorted wood screws, nuts, machine |
| 1 electric soldering iron.   | screws.                             |
| 1 Westcott wrench.           | Nails.                              |

worth to the contracting trades; and the same thing applies to new material, such as fittings, fixtures, switches, panel boards, etc. Very often several samples can be obtained, and the labor used in trying them out is often well spent, for once a good new tool or device is located, it commences to pay dividends by reducing costs, and its early adoption is desirable. On the other hand, if a fitting is not worth using, a trial establishes the fact and settles the question once and for all.

It is almost trite to suggest that the superintendent should have a thorough knowledge of both the inspection and union rules governing every job. Men soon lose their respect for a superintendent who does not know as much about the business as they do, consequently it is a professional necessity to be completely posted on regulations and able to give a correct answer to any

reasonable question. This means hours of study, and close examination of all changes in the code, but it should be assumed as a part of the job and done very carefully.

Furthermore, unless the superintendent has an excellent knowledge of rules, he is likely to overlook some faulty condition with the result that much money may be wasted later in correcting the mistake at an inspector's order. To guard his own reputation and pride, and to conserve the money of his employer, the superintendent must study these rules and regulations as a veritable Bible of his trade.

Not only should the superintendent have a care about his own technical education, but he should foster better training among his men. Almost every city and town offers some means for instruction in electricity, and the men who attend such courses inevitably be-



come better workmen because they understand more completely what they are doing out on the job. The elementary laws of electricity are rather simple, and a little training in mathematics, plus a good course of instruction in electrical theory will help to produce a very desirable type of workman. It is certainly true that less trouble is found with the work of trained men, than with the product of untrained or wholly practical workers, simply because the man with a little book knowledge learns pertinent facts about electricity that can never be acquired by ordinary practical work alone.

The writer believes that in almost every case, the workman with interest enough to study his trade is worthy of better than the average pay, is probably a future superintendent in the making, and in any event is developing a certain pride of workmanship which inevitably redounds to the credit of his employer. We cannot expect to recruit our working crews from University Clubs, but at least we can strive to better educate our employees, for their sakes, and our own.

#### Workmen's Tools

Clothes may not make the man, but tools certainly do a great deal to make the workman. A complete kit of good tools can be listed as a vital essential to the production of fine work in a minimum of time, for it is only the man with the equipment to meet every probable condition who can be sent out on a job with the expectation of doing speedy work, and doing it right.

Where union men are employed, the contents of kits may be more or less specified by the union officials; where non-union shops thrive, the individual proprietors are the rulers as to kit equipment. How many superintendents ever look into the bags of their men, or question them as to their adequate supply of tools? It is safe to say that very few ever give the matter a thought, yet it is of extreme importance. If dealing with unions, the electrical contractors should reach some agreement as to the fair requirements, while if outside union jurisdiction, individual electragists should decide what tools their men need, and prescribe them.

The following list includes the tools generally required on ordinary new work, and jobbing. Every tool must be in good condition to be of any real value.

While requiring each workman to

furnish a suitable kit of tools, the contractor should not lose sight of the fact that he must himself supply many of the heavier and less common tools, and they too should be kept in good condition. For instance, many shops carelessly send old, worn dies to their jobs. All right—suppose an inch pipe is threaded, if the die is not sharp, or if the binding screws permit it to slip, the workman must run the die over the thread two or three times. This means many minutes wasted—many dollars

wasted. Dollars which might well be saved by sending out equipment worthy of use by good men. It is inspiring and complimentary to the men to have first class tools sent for their use, and vice versa, they become careless and shiftless if the shop has so little pride as to send them worn, useless equipment.

The right tools, at the right time, and in perfect condition should be the aim of every shop. And the right tools for the average contractor are about as given in the list just preceding.

These tools should be overhauled every time they are returned from a job, cleaned, sharpened, oiled and stored properly. They should be issued on a special tool requisition, and the foreman on each job should be held responsible for their return in good condition, less reasonable wear and tear.

Electragists from time to time attempt to devise some way of increasing the unit output of employees.

#### Incentives for the Men

Experts on production methods have devised several schemes adapted to industrial conditions whereby the unit output of employees may be increased, typical examples being bonus and piece work systems. However, these can not ordinarily be used in construction work; first, because union shops are not permitted to offer such special inducements, and secondly, because there is no way of measuring accurately the output of a building trades workman on the piecework basis. Consequently, the average contractor will find some difficulty in hitting upon a successful incentive for his workmen to produce more than a nominal amount.

Where union rules do not interfere, the bonus system can be used to a certain extent. That is, the foreman can be told how much the labor estimate is, and an offer of half the saving he effects might be made to him. The objection to this is that very often some factor not under the control of the foreman prevents him from doing the job most efficiently, and he is then sure to be dissatisfied if no bonus is forthcoming. In other words, unless the contractor is sure he can handle the job flawlessly from the office end, so that no delays will occur that are not directly the fault of the foreman, he is wise to keep away from offers of bonuses.

Furthermore, any estimate of labor is

#### The Average Contractor Should Own These Tools

- 10 portable pipe benches.
- 10 pipe vises.
- 2 vices with anvils.
- 10 3-way die stocks,  $\frac{1}{2}$  in.,  $\frac{3}{4}$  in., 1 in.
- 4 die stocks, each size from 1 in. to 2 in.
- 2 die stocks, each size from 2 in. to 4 in. Ratchet.
- Complete sets of dies for above, with spares.
- 10  $\frac{1}{2}$  in. hickies.
- 10  $\frac{3}{4}$  in. hickies.
- 5 1 in. hickies.
- 1 pipe bender for each size 1 in. up to 3 in.
- 3 24 in. pipe wrenches.
- 10 tool chests.
- 3 hand saws.
- 3 Jiffy cutters, or circular saws.
- 3 plumbers' torches.
- 10 oil cans.
- 4 6 ft. ladders.
- 10 8 ft. ladders.
- 5 10 ft. ladders.
- 2 12 ft. ladders.
- 2 14 ft. ladders.
- 1 extension ladder.
- 2 chain hoists.
- Miscellaneous, blocks, tackle, pry bars, etc.
- 4 electric drills.
- 1 electric hammer.
- Complete set of star drills, twist drills, and holders.
- 1 winch.
- 1 hydraulic jack.
- 1 sheet metal punch.
- 1 bench drill, portable.
- 1 grinder, portable, electric.
- 1 power drive.
- Voltmeters, ammeters, etc., suited to local conditions.

at best merely a shrewd average, lacking any semblance to the accuracy with which factories are able to determine how much labor a given job, or operation, should take. Thus, when a factory initiates a bonus system, the management knows exactly what can be expected of a man, because identical conditions exist for every unit produced.

But the building industry does not often work on identical jobs, hence an estimate of labor may or may not be fair. If it is low, it is hardly just to offer a bonus when the chances are it cannot be earned. If the estimate is high, the foreman wins a bonus to which he is not really entitled. The conclusion? To avoid any possible ill feeling on the part of either foreman or management, the bonus method, and similar schemes as well, should be avoided when searching for some means to increase production.

Probably the most effective incentive is the promise of steady or fairly steady work over long periods. The average workman in the building trades is constantly faced with the fear of layoffs. If he knows that his employer will do everything possible to keep him busy, he will take a greater interest in his work, and will be more willing to produce.

#### Facts for Foremen

With working crews scattered over a city, a state, or perhaps the whole country, the contractor soon finds that his interests are best served only if he gives each foreman all possible information regarding his particular job. In other industries a few high executives can keep the details to themselves, for they are always readily available to make decisions. Their foremen, plant superintendents, etc., handle merely routine production, without any great necessity for a broad view of the whole enterprise.

But when a building is going skyward, many questions arise, many decisions are needed, and an appeal cannot be made to an office a hundred miles away for instructions. The only safe policy, then, is that of open dealing with the foreman, furnishing him with complete plans, working drawings, and special data. Then, and then only, he is in a position to intelligently deal with the many questions arising as to locations, methods of wiring or control, conflict with other trades, etc.

This matter of giving the foreman complete information calls for some careful work at the office, by a man with a knowledge of construction conditions. First of all, in many cases plans come from the architect with just a few outlets shown, and a specification thrown in to cover a multitude of professional sins of omission. Give such plans to a foreman, and invariably he wastes time and material trying to puzzle out just what is intended.

#### Logical Procedure

The logical procedure is to take such a set of plans, trace the building outlines, spot in the outlets called for, and then lay out the whole job with careful attention to every detail. The result should be a well engineered product, giving every detail that the foreman is likely to look for as he carries on the work.

Dimensions of special apparatus, all conduit and wire sizes, and similar information should be set down on the revised plans, and then as a final check, the whole set should be submitted to the architect for approval. As a further caution, the manufacturers of special machinery should be consulted as to the characteristics of their apparatus, and other contractors, such as heating and plumbing contractors should be called upon for details of their equipment which the electrician may be required to wire.

*Get the facts. Put them on paper. Get them approved by the proper authorities. Give them to the foreman and be sure he understands them.* If this is done, time and material—money—will inevitably be saved. If may cost fifty or seventy-five dollars to lay out a fifteen thousand dollar job, but if that layout shows how to most economically run conduit, and settles questions that might otherwise waste time, the net return is very much worth while. Furthermore, if a man is working from an approved plan, he has little chance of making a mistake which the architect might later discover and order the contractor to correct.

Mistakes are twice costly, for they are expensive to correct, and cause the contractor to lose prestige in the eyes of the architect. In addition, they blemish an otherwise perfect job and remain as a permanent indictment of the electragist's skill. They can be avoided solely

by careful superintendence of men who are working from complete plans.

Special features are more likely to give trouble than any other phase of a job. The average journeyman becomes quite adept at installing conduit, pulling in wire, connecting switches; but give him something out of the ordinary and he slows down. Have you ever watched a workman wasting time trying to puzzle out a simple remote controlled solenoid switch, or an automatic motor starter?

Lack of information is the cause, and the preventive is simply to send details of every special feature. Manufacturers ordinarily send drawings and connection diagrams with apparatus the least bit complicated, but these are sometimes forgotten or lost. Instructions to foremen should require them to obtain from the office details of any piece of apparatus which reaches the job unaccompanied by complete erection, connection and operation information. No attempt should be made to hook up or run any equipment without the aid of diagrams, not only because time is wasted figuring out connections, but because in experimenting, damage may be done to the apparatus.

#### Record of Orders

One bit of information that a foreman is sure to appreciate is some record of material that is ordered by executives at the office. The foreman must of necessity requisition a great deal of routine material as he sees the need for it, but unless he has information as to what his office is itself ordering, he is certain sooner or later to duplicate an order, causing needless cartage charges, needless handling expense, and often needless outlay for special or semi-special material. As noted in a previous article, the odd stock section of the average stock room is a nice graveyard of capital, filled by careless ordering, often due to "too many cooks." That is what happens when a purchasing agent orders part of the job supplies, with the foreman independently sending in requisitions for the rest.

The preventive is first to have all requisitions from the foreman pass over the purchasing agent's desk, for checking against material he has personally ordered; and secondly, duplicates of all orders originating at the office should be immediately sent to the job foremen for their information and guidance.

*(To be continued)*



## How Laube Stayed in Business Twenty Years



G. Fred Laube

ROCHESTER, New York, prides itself on a good many things, such as being the place that sends kodaks to every part of the known world, having one of the first two Red Seal licenses issued in this country and a good many other things that the Chamber of Commerce will be glad to list. It also thinks well of itself for another thing: That is, being the home of G. Fred Laube and his electrical business.

The last isn't applesauce. I talked to Rochester business men both in and out of the electrical field and whenever I mentioned Fred Laube I always got the same reaction: The man was an asset to the city and his activities in the councils of so many national associations reflected considerable credit on the town that had helped him grow to such large stature. None of his fellow business men stopped over but all were quietly proud of Fred Laube's achievements.

### Room for Ambition

This story isn't meant to be a panegyric either. In the first place Laube isn't much for that sort of stuff and in the second the real object of this article is to show that men can pick out the electrical contractor-dealer business as a life-work and need never regret their choice from either a social or a financial standpoint. They will find in it as much elbow-room for a long-distance ambition as they will in banking or the law, or in any other business or profession. We hear a good deal about the large number of failures in this branch of the electrical industry. All right, but how about some statistics on the number of doctors and lawyers and architects who have given up their chosen career after some years of hard knocks? The point is, that it isn't the business that makes a contractor-dealer fail, it's the way he does that business.

Although the Laube Electrical Corporation does one of the largest exclusively-electrical businesses in the country, its owner wasn't always a man of wide interests. As a matter of fact, he failed in the very first venture he made on his own.

His history is like that of many other contractor-dealers. After working for some years as a journeyman electrician, he won his way to a foreman's job with an electrical construction company of considerable size. While on this job, he did considerable work for his company in Rochester and came to know the electrical possibilities of the town. Like the average ambitious young fellow, he had harbored the desire to start in business for himself, and Rochester, he decided, was the place to do it. He had found the other contractors affable and helpful to the foreman of a big concern, the electrical idea was gaining headway in the town and right then appeared to be a good time to jump into the game.

Accordingly he quit his job, took his modest capital out of the bank and started a small store. However, he found the conditions that confronted him as a small competitor a good deal different and harder than the ones he had faced as the representative of a large and influential firm. People who wanted wiring done didn't take his ability for granted as they did that of his former employers. He had to prove himself first and he couldn't prove himself without work to do. Then the other contractors in town weren't quite so affable to this insignificant rival for their business as they had been to the foreman of a big company. They held aloof from him. As a result, he attempted to fight back on a price basis and in just fourteen months failed for \$1,400.

### Lessons of Failure

When the smash came, he sat down and thought things over. He discovered he had learned two things from his failure: The first was that you cannot do business on a policy of trying to beat the other fellow's prices because you lose whether you get the contract or not.

The second was that no man ever learned much about his own business if he wasn't willing to let others know about his mistakes and his successes. If he were willing to help his competitors be better business men, he would find them willing to do as much for him. That meant joining the various associations, local and national; and that is what he did at once.

### Second Start Modest

Having learned these lessons, he was ready to go back into business. But this time he wasn't quite so eager to put up a big front at the start. No store with a high rent and other items of overhead for him this time. He took a part of the basement of a shoe store, whose proprietor he knew. When business began to grow and he needed more space he still stuck to the sub-surface plan, merely taking another basement with more space. Trade kept on getting better and finally he shifted to a small side-street store. This was followed by another and larger side-street store and at length after about ten years of successful operation he made the big jump to a Main Street location. Now he occupies more space with his retail department than any other electrical store in Rochester. For that matter there are few electrical stores in the United States

as large as his has grown to be.

If there is one thing more than any other that explains this steady progress of twenty years, it is probably the fact that Fred Laube understands the public. He has found out that it doesn't kick about fair prices if they are accompanied with good work. It is the only way of gaining public good will, which grows like a rolling snowball once it has a start. Just how much the public thinks of the Laube business is evidenced by the fact that every week from thirty to forty women attend a lecture at the store on electrical homes. Each week a different group is scheduled from various women's organizations and the lecture has become so popular that dates are being booked months ahead. If the public didn't like it and trust G. Fred Laube, this plan of selling the electrical idea could not have been successful.

Next to good public relations, the prime requisite for a successful business is employee relations. Thus it should be interesting to know how Laube maintains the latter. The size of his force is indicated by the attendance at the last employee picnic, numbering 102. Many of these men and women have been in his employ for a number of years and his employee turnover is comparatively small. The Laube policy is to be fair, to be strict and at the same time to be reasonable.

When an employee is doing good work, his boss never hesitates to tell him so. He doesn't bubble over about it or go around slapping his men on the back and calling them by their first names, but he never lets ability and efficiency go unrecognized. When the man does bad work, he hears from his employer about that also, without being "bawled out" about it.

#### No Alibis Accepted

"I can excuse mistakes," Fred Laube told the interviewer, "but there's no alibi for carelessness. Any man is apt to use bad judgment once in a while, but slipshod work shows that a man is not being honest, either with his employer or himself."

The Laube personnel ought to be good for it has been built up by fair methods. One of the owner's principles is never to take a man away from his competitor. If a workman has already quit a competitor, that is a different matter, but there is never a job waiting for the man who comes in and says:

"I'm working for so-and-so but I'll take a job with you if it means more money."

Once they are working for the company, they have every chance to get ahead. Selling is the avenue that is held open for most of them, for Fred Laube believes that that is the pivotal point of a business. All the wiremen and even the store clerks are encouraged to sell appliances in their outside hours and regular commissions are paid them on this business. One example of how this works is the rise of a young fellow who was driving one of the company trucks a few years ago. He decided after a while he needed more money and asked the boss for a raise. He was told that his job didn't pay any more



The Three Tags Above Are Different Colors to Indicate the Condition of the Stock of Each Style of Fixture. Below is the Reverse Side of One of the Tags, the Numbers Being Checked to Show the Quantity of that Fixture in Stock

than he was getting but there was no reason why he couldn't do some selling. It was suggested that he try to sell an appliance to every customer to whom he made a delivery during the day. For a while he didn't sell very much; then he seemed to find his feet and before long had been so successful that he was taken off the truck and brought into the store.

Following public and employee relations in importance, in Mr. Laube's experience, is contact with your fellow businessmen. Whenever you meet a successful business man you absorb his philosophy, learn things about methods that you probably would not think of yourself and cannot help being stimulated in an atmosphere of success.

The best place to meet competitors is in an association, either local or national, and for that reason Mr. Laube is one of the strongest advocates of association membership that can be found in the business. He joined the local contractor-dealer organization soon after he started in business the second time and is now one of its leaders. He has been prominent in the work of the Rochester Electrical League, of which he is a director, and he is ready and willing to join in any co-operative effort for electrical progress. In addition to local work, he has gone in for national association work, being a member and director of the Society for Electrical Development, a member and director of the National Association of Lighting Fixture Dealers and a member of the Association of Electragists, International.

#### Meeting the Best Minds

He gives a great deal of his time to association work of one kind or another, yet his business continues to grow. He ascribes it to the ideas he gets and the inspiration that comes from meeting the best minds in the industry. It is his thought that hard work will accomplish much but hard work plus good ideas will do wonders.

Many of these ideas are discernable in actual practice in his business. For instance, in the contracting department. The one rule, from which there is no deviation at any time, is that every job MUST carry the proper overhead and profit. This wasn't something he found out by instinct, because his earlier failure showed he didn't know how to figure overhead and profit. Therefore he must have found it out, partly through experience and partly through meeting competitors who knew it already.

There are other methods he is using in the department for which he probably got the ideas from other business men and which he is just as willing to pass on. One of his ways of cutting down lost time by wiremen is to have a traveling foreman who keeps track of the progress of each job and has another one laid out for the workmen as soon as the previous one is finished, whether that be in the middle of the morning or the afternoon. Another idea is numbering the bins used for stowing away appliances and materials that are to be repaired. Each repair order is then given a bin number and by using that number all through the job, confusion is elim-



inated and checking the order is made easy.

His shop lives up to the name of his business—"Rochester's Electrical Department Store"—for it is thoroughly departmentalized. The stock room, with its steel bins, is separated from the rest of the shop by a wire lattice so that all supplies must come through the hands of the stock keeper. The motor repair department, the appliance repair department, the special fixture department, the wiring department, all are separate units, both as to space assigned them and as to management.

It is in the merchandising field, however, that the Laube Electrical Corporation, particularly shines. Practically every type of electrical merchandise can be had there, not only can be had but is really merchandised. A good many electrical dealers kick because non-electrical stores carry electrical goods at cut prices as leaders to sell their standard goods. Fred Laube doesn't kick about this situation because he is fighting fire with fire. He uses non-electrical goods at low prices in order to get the public in for a look at his electrical stock. Sometimes it is aluminum ware, sometimes a good grade of paints, sometimes table or wall decorations, but always there is something. He doesn't lose money on it, either, since the turnover is always very fast. Then he has adopted the five-and-ten-cent store idea of having small, inexpensive items, such as fuses and double-sockets, in trays upon a table in the middle of the store.

Having special sales every so often is another of his policies and he finds it just as good for his business as the regular department stores find it for theirs. This past April was the twentieth anniversary of his start, so he took advantage of that to announce an "Anniversary Sale." There must be a reason for each sale, he holds, for otherwise the public will place the merchant in a class with those who have "Fire Sales" all year round.

#### Sales to Build Volume

In conducting the sale, he lowers prices on a certain number of articles, brings the public to his store and increases volume to such an extent that it considerably more than makes up for the lower prices. In this last sale his volume went 43 percent over that for the same period the year before.

The fixture department of the store



The Night-Time Appearance of the Laube Store, Proving that its Owner Both Sells and Practices Good Lighting

occupies almost half the space on the ground floor. Fixtures are the first things to catch the eye when you enter the store but they do not have the effect of being obtrusive, because they are led up to gradually by banks of floor and table lamps. At the rear of the store are three display rooms, with each fixture controlled by a separate switch.

A good part of the fixture department business consists of special fixtures and special finishes. Three finishes are offered for each type of fixture in stock, but in addition to these the finishing department is ready to suggest and supply whatever finish is needed to go with any special decorative scheme. In making these suggestions the salesmen have found that it pays to have sketches made in color rather than to use photographs, in order to give the prospect an idea of what he will get. These sketches are prepared by the drafting department.

Another idea which may prove of value to other fixture dealers is found in the system of tags used. Each fixture has a small tag which bears the stock number and the price of the fixture. Some of the tags are red, which indicates that that fixture is carried in quantities. On the back of the tag are figures, from 1 to 25, and they are checked as this fixture is sold, indicating the number of fixtures of this particular type on hand. The fixture with the green tag indicates that samples only are carried. The yellow tag indicates that it is a slow mover and the salesman is allowed an extra 10 percent for disposing of it.

Considering the fact that the store is

one of the largest electrical establishments in the country, it might be well to tell how it became that way and what are the views of its owner on the subject of expansion. Fred Laube's answer to this question is, "Expand slowly and then you won't have to take in sail later on." The story of his move to Main Street illustrates what he means. He considered it for three years before making the jump and then for a month before signing the lease he conducted a traffic check on both the sidestreet and the main thoroughfare.

#### Policy on Expansion

When he did move in, he took only one store space. Business grew and he needed more room but he got it by taking the rear and cheaper part of the store next to him. His further growth has all been on the same plan. He took more space only when he absolutely needed it.

He is a firm believer in the value of advertising, and in the worth of expert advice on the subject. From the beginning he has had an agency write his copy and buy his space for him, and his advice to other small merchants who want to advertise is to do the same. The time they save and the better copy is well worth the agency's commission.

Every man will differ in the way he arranges the details of his business, but the general principles Fred Laube has learned through long experience can be applied by everyone. They are, to know always where you want your business to go and then to find out the best way to get there.

# How to Lay Out Power Wiring According to New Code

By ROBERT A. GOELLER  
Vice-President, Hatzel & Buehler, Inc., New York

(Continued from last month)

This is the last of a series of diagrams which bring out more comprehensively the various regulations of the 1925 Code pertaining to the protection of motors and motor circuits. A study of them will enable the contractor with the motor wiring job not only to understand more thoroughly the various Code rules as applied thereto, but to select the most economical permissible type of system for various conditions of service.—EDITOR.

Diagram No. 5

Diagram No. 5 shows a motor started at full voltage through a remote controlled automatic circuit breaker. In this type of protective device there is provided either trip coils or overload relays usually equipped with time delay devices so that the circuit will not open on peak currents of short duration. If these peak currents are continued for any reason whatsoever, beyond the time limit of the relay or trip coil, the circuit breaker is tripped in the conventional manner. In some cases instantaneous type trip coils or overload relays are provided where special operating conditions dictate them, but for general motor practice the time delay feature is a very desirable one.

No voltage protection is usually provided. It is a very desirable feature from a safety point of view, although not required by the Code.

At the present time the Code does not assume that these devices are free from unskilled manipulation in that the adjustment of the overload setting beyond the allowable percentage over the lower nameplate current rating as well as the conductor rating supplying the motor is quite possible by people with no idea of the hazards they may be creating. Therefore, certain safeguards are provided. Thus section 809 b, subparagraph 7, provides that "Circuit breakers may not be used for the running

protection of motors except (a) where fuses are also provided according to subparagraphs 1 and 2 preceding, (b) on main switchboards, (c) where otherwise subject to competent supervision, (d) where next back on the line are fuses rated or circuit breakers set at not over 300 percent of the motor nameplate rating, or (e) for circuits having

a maximum capacity greater than that for which approved fuses are rated." Qualification (a) would naturally apply to an installation in small shops, factories, etc., which, due to their size, would not require an experienced plant electrician and where, in case of trouble, inexperienced tampering with the circuit breaker would most likely result.

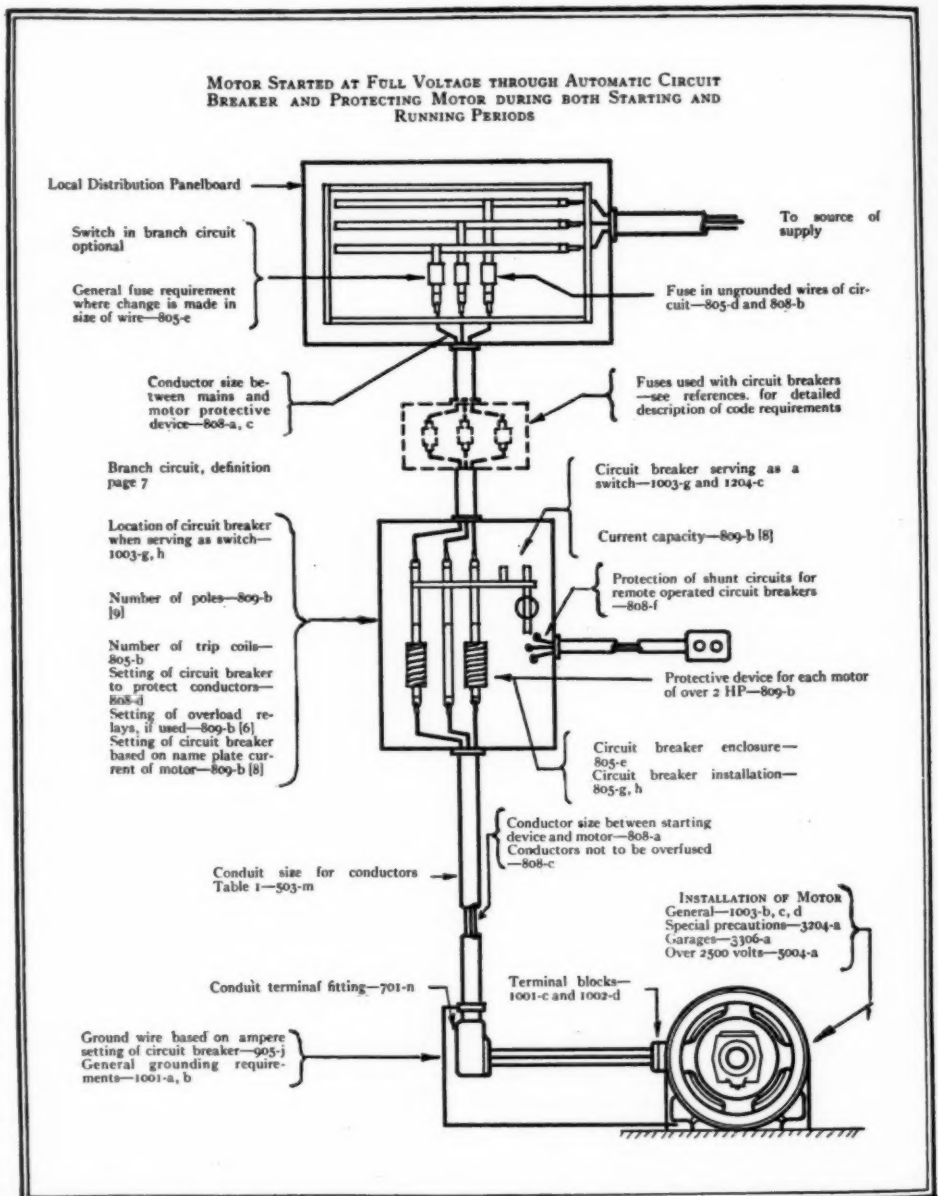


Diagram No. 5



As circuit breaker type starters usually throw the motor across the line at full voltage, the starting currents range from 200 percent to 300 percent of the motor nameplate rating. It is therefore evident that if fuses of 125 percent of the motor rating as called for in subparagraph 1 (809b) were used, in addition to the circuit breaker and located adjacent thereto, the starting period would have to be of very short duration. Such an arrangement must of course be avoided and some other permissible type of fuse protection provided. Qualification (d) above provides that where the next fuse back on the line does not exceed 300 percent of the motor nameplate rating circuit breakers may be used without further fuse protection.

Therefore, if each branch motor circuit is taken separately from a power panel as outlined in Diagram 5 and the branch circuit fuses for the motor shown are not over 300 percent then other fuses will not be required.

If fuses of 300 percent of the motor nameplate rating are used at the power panel consideration must be given to conductor size, although the reader is reminded that the Code recognizes that starting currents are normally of short duration and that to require conductors of a comparable size would tend to raise the cost of installation unnecessarily. Therefore in order to permit the selection of a conductor consistent with this peculiar type of service, section 808c permits the conductor to be selected on the basis of the conductor capacities as given in column C of Table No. 1 of section 610.

In the example that follows it is assumed that the maximum size fuses of full 300 percent are used in the branch circuit power panel.

#### EXAMPLE No. 1

*Conductor size between panel and starting device.*

##### Case 1

Nameplate current rating of motor— $10 \text{ amps.} \times 300\% = 30 \text{ amps.}$

Section 610, table No. 1, col. C—30 amps. requires No. 10 wire.

Now, if Section 808c did not permit of this arrangement the conductors would have to be as follows:

##### Case 2

Nameplate current rating of motor— $10 \text{ amps.} \times 300\% = 30 \text{ amps.}$

Section 610, table No. 1, column A—30 amps. requires No. 8 wire. (This is

the nearest size for this capacity).

In determining the conductor size between the circuit breaker and motor, consideration first to Section 808a is necessary and also to Section 809b, subparagraph 8. The former requires that "the conductors of circuits supplying current to a single motor shall have a carrying capacity, according to Section 610 of this Code, which is not less than 110 percent of the nameplate current rating of the motor."

The second sentence of the latter states that "If the circuit breaker is of the time limit type its setting shall not exceed 125 percent and if of the instantaneous type not over 160 percent of the nameplate rating of the motor."

The following example shows how these rules work in combination.

#### EXAMPLE No. 2

*Conductor size between motor protective circuit breaker and motor and setting of same to protect conductors.*

##### Case 1

Nameplate current rating of motor  $10 \text{ amps.} \times 110\% = 11 \text{ amps.}$  Section 808a.

Setting of time limit type circuit breaker  $10 \text{ amps.} \times 125\% = 12\frac{1}{2} \text{ amps.}$  Section 809b, subpar. 7.

Nearest sized conductor R. C. conductor for both cases, No. 14 having capacity of 15 amps. Nearest size fuse 15 amps.

##### Case 2

Nameplate current rating of motor— $13.5 \text{ amps.} \times 110\% = 14.85 \text{ amps.}$

Setting of time limit type circuit breaker  $13.5 \text{ amps.} \times 125\% = 16.68 \text{ amps.}$

Nearest size conductor on basis of 110%—No. 14 gauge R. C. or 15 amps.

Nearest size conductor on basis of 125%—No. 12 gauge R. C. or 20 amps.

With small motors as in case No. 1 it is seen that the available conductor size gives some latitude regardless of whether it is based on 110 percent or 125 percent of motor current. For larger motors as in case No. 2, a slightly different problem appears, for, should the maximum size fuse permitted under this condition be used, the next larger conductor would have to be used. Therefore, it would be a choice whether the conductor size was made larger to permit of the maximum size fuse or the fuse size reduced to protect the conductor size based on the 110 percent factor. It would seem better practice to select a conductor size that would

permit of the maximum fuse capacity so as to avoid continual blowing from short overloads which might soon lead to the substitution of larger fuses thereby overfusing the smaller size conductor. However, it should be borne in mind that where each motor is supplied by a separate circuit from a branch circuit power panel the fuses in the panel would range from 200 percent to 300 percent of the nameplate current rating of the motor and the conductors would have to be figured on the basis of example No. 1, according to the assumed percentage of starting current.

In this type of installation it must be understood that the conductors between the branch circuit power panel and the circuit breaker do not have to be larger than the conductors between the latter and the motor, except when the fuses in the power panel have only a small margin over the normal full load running current.

While this diagram shows a remote control circuit breaker, all of the preceding description coming under this type of motor protective device applies to the manually operated type as well, except of course that the remote control push button conductors would not be used. As the 1925 Code now specifically treats the subject of protecting these remote control wires, some mention of it here seems appropriate.

#### Sufficient Protection

By referring to Section 808f, it will be noted that these conductors are "considered as being sufficiently protected by the motor circuit protective device required by the preceding paragraphs of this section, provided they are suitably protected from mechanical injury and do not extend beyond the machine on which the starter may be installed."

From this latter requirement it will be inferred that should these conductors be extended beyond the machine appropriate fuse protection must be provided, although it is hardly to be expected if the motor is protected by a circuit breaker which setting will also protect the remote control conductors that a separate set of fuses would have to be provided to protect them even though they were extended beyond the machine. However, where the motor protective device is set above 15 amp. it is evident that the remote control conductors might be overfused, as they are seldom of a size over No. 14.

# A Card System for Stock Control

***Watertown Contractor Finds It Easy to Set Up and Maintain, and Valuable for Ordering, Billing, Estimating and at Inventory Time***

**A** CARD index system which tells at a glance everything a contractor wants to know about the material he has in stock is being used effectively by Harold W. Benoit, an electrical contractor-dealer of Watertown, N. Y. The material consists of the standard "Kardex" card-filing system with a card made up by a local job printer from the specifications of Mr. Benoit.

The files are divided into four main subdivisions under the headings:

## Appliances, Fixtures, Glassware, Supplies

Under each main heading are filed cards covering all the regular items of that line carried in stock. For instance, under "Supplies" are found cards listing conduit, condulets, rubber-covered wire, armored cable, etc. These are arranged alphabetically and the owner or the stock clerk can turn at once to the card and find out without a moment's delay the information he requires.

The design of the cards is as shown in the illustration. At the top are the headings, Voucher, Account Number, Quantity, Catalog Number, Invoice Cost, Freight and Expressage, Total Cost. At the bottom are the sideheadings, Minimum, Wholesale Cost, Selling Cost. A space is provided at the bottom for the name of the item and its size or type. Each order is given its separate horizontal space across the card.

In the "Voucher" column is put the number of the voucher covering the order. This affords a quick check back to the voucher if that is ever necessary. Each account with jobber or manufac-

turer receives its individual number and this is placed in the next column. Then follows the date the material is received and the column to the right of that gives the quantity ordered. The jobber's or manufacturer's catalogue number is given next and this enables the stock

Benoit has worked out from experience the maximum quantity of each item he should have in stock and also the point below which his stock of that item should not fall. The difference between these quantities is the amount that should be ordered each time and it is

indicated to the man doing the ordering by the amount of previous orders listed under the heading "Quantity." Oftentimes Br. Benoit is out of town for several days at a time but the card enables his clerks to do necessary ordering correctly.

Also the plainly-noted selling price enables clerks to bill all orders and work correctly and speedily.

Another advantage is the check it affords on the movement of each item in stock. This is arrived at by

checking the quantity still in stock against the date when the last order was received.

## Louisville Test Discloses "Guess" Bids

At a recent meeting of the Contractors' exchange of Louisville it was demonstrated to those present that many contractors are trying to guess their way to a profit when they bid on jobs. Those attending the meeting were asked to give a bid on a three-circuit one-floor job. Previously it had been worked out that in order to show a legitimate profit the bid should total about \$117.50. Estimates given at the meeting, however, ranged from a low bid of \$82.00 to an estimate of \$153, or about 100 per cent difference between the highest and lowest bid.

[illegible]

**The Card Index System Described Here Requires the Use of Only a Single Type of Card, Such as Shown**

clerk to refer to the proper catalogue at once if ordering by mail. Cost is given four spaces in order to show the elements of the cost, the amount of money tied up in each item and the cost per unit of the material.

This unit cost is repeated at the bottom in the space headed "Wholesale." It is easy to add the proper overhead and profit and arrive at the selling price per unit. At the lower left hand corner the space headed "Min" carries a notation of the point below which the stock should not go.

Mr. Benoit does not maintain a perpetual inventory system and the value of this card system at inventory time is plain since it gives the unit cost of each item.

The day-to-day advantages are even more marked. One of them is preventing an excessive stock of any item. Mr.





account of the large difference in unit times between these two operations. Two classes of large pipe work are also listed—feeders and motor circuits. This separation should be made on a large office building or similar job, where a number of feeder runs are carried along together on hangers, while the motor circuits are installed at a different time and in a different manner. It would not be practical and would serve no useful purpose to make this separation on some types of industrial plant jobs. Where all work is exposed, feeder runs are short and few in number, and the operations of installing feeders and motor branches are carried on together. On all large pipe work, the time on each size should be recorded when this can be done; under certain conditions it is not practicable to separate the time in this way and it should not be attempted. For example, in the common case of a run of large conduits of several sizes carried from a switchboard across the basement ceiling to a rising point and up a shaft, it is probable that work on two or more different sizes would be going on almost simultaneously. Under these or any other conditions where a man or a crew are changing operations every few minutes, it is obviously impossible for the men to keep an accurate record of their own time subdivided and charged to the various operations.

Cabinets and pull boxes (Operation 5) should be clearly understood to include only the work of installing the cabinet or box, and no time for connecting conduits to the box, because work on the box and work on the conduits are separate and distinct operations.

On account of the wide variety of low tension apparatus the operations have not been listed. The records should be so kept that the time can be computed for installing and connecting each piece of apparatus such as a bell, fire alarm station, or telephone. If terminal strips are used, the time per terminal for installing and connecting is wanted.

All other items should be sufficiently clear without any special explanation.

#### Quantities

If the sole purpose of the records is to find the unit times for operations, all quantities of materials installed may be taken from the job cost records after the job is completed. However, the contractor will often wish to keep some

List of Operations	
1. Branch circuit pipe and outlet boxes—floor or ceiling work.	necting motors. Time on each motor. Separate time on erecting if this can be given accurately.
2. Branch circuit pipe and outlet boxes—wall work.	15. Switchboards. Separate time into four parts:
Include in Classes 1 and 2 time on low tension work and any other conduit not larger than 1" which is installed at the same time as the lighting branch circuits.	15-A—Unload and move to location.
If all work is exposed, Class 1 is to include all work, both on ceilings and walls.	15-B—Erect frame and panels.
3. Large pipe—feeders—separate time on each size when this can be given accurately.	15-C—Erect bus work.
4. Large pipe—motor branch circuits. Separate time on each size when this can be given accurately.	15-D—Connect feeders.
5. Cabinets and pull boxes—time on each.	16. Push and tumbler switches. Report time and number installed.
6. Cabinet trims. Time on each.	17. Plug receptacles. Report time and number installed.
7. Panelboards. Time on each.	18. Armored Cable. Report time and number of outlets installed.
8. Making taps to feeder cables. Time to complete work at each cabinet.	19. Metal molding. Report time and number of outlets installed.
9. Wire—lighting circuits. Report total time and feet pulled in.	20. Drop cords. Time and number installed.
10. Making splices at outlets. Give location.	21. Fixtures. Time and number installed. Separate time on each kind of fixture
11. Wire—low tension. Report time and feet of each size pulled in.	22. Low-tension apparatus. Separate time on each kind of work as far as possible.
12. Wire—feeders and motor circuits. Report sizes pulled and separate time on each size if this can be given accurately.	23. Channelling. Report time, describe work.
13. Erecting motors, not including connecting—time on each motor.	24. Drilling walls or floors. Report time and describe work.
14. Erecting and connecting motor starters and controllers and con-	25. Installing hangers. Time and number installed.
	26. Receiving, shipping and moving material.
	27. Lost time.
	28. Supervision.
	29. Miscellaneous. State work done.

sort of progress record and to check actual labor costs against estimated costs at regular intervals during the progress of the work. To do this it is necessary to have a report of the quantities installed each day. Even when the chief object of the records is merely to collect labor data, the time will be reported more accurately if quantities of material are reported also.

On operations 1 and 2—branch circuit pipe and outlet boxes—the quantity reported should by all means be the number of outlet boxes installed. The workmen can ascertain the number of outlets installed in one day in much less time and far more accurately than the number of feet of pipe installed. A still better plan is to use a few extra blue prints and let the job foreman mark with colored pencil the outlets installed each day. By using three colors one print may conveniently be used for three days; it is then sent to the office where the marks are transferred to a master set of prints and the outlets installed are counted and recorded.

The best method in the case of large

pipe is to report what runs were worked on and what runs were completed. For this purpose it is convenient to number each feeder on the riser diagram, and to number each motor, so that the runs can be described on the daily reports by merely giving the numbers. The quantity of pipe in any given run can be taken from the estimate.

In the case of small wire, the quantity pulled in per day can easily be recorded by the workmen. Quantities of switches, receptacles, drop cords, fixtures, etc., can also be reported with little difficulty. Large wire should be handled in the same manner as the large pipe, that is, runs worked on and runs completed are reported by number, and the length of each run is taken from the estimate.

#### Records

The Daily Time and Work Report which is illustrated here is a combination of the best features of similar forms which have been used for several years by two contractors who have done a great deal of this work. Filling out this report is of course the first step.



The most important thing about keeping the records is to examine the daily reports every day and make sure that they have been turned in, that they are intelligible, and that the necessary data is reported. It will take some time for the job foreman to learn just what is wanted on these reports, and some men may become careless and fail to follow instructions. If the sheets are checked every day, any errors or omissions will be found immediately and can easily be corrected, while after a week or two have elapsed it will be difficult or perhaps impossible to make the corrections.

A simple form of record may be kept on any conveniently ruled sheets such as No. 4 of the A. E. I. estimating forms. At the beginning of the work on the job, one sheet is assigned to each operation, additional sheets being added later as needed. On each sheet, one column is used for date, the next for quantities installed, the third for labor hours, and the fourth for labor costs.

It was stated above that in case of large pipe it is sometimes not practicable for the men to keep their time separated between the different sizes. If this happens many times, and the time is recorded in this way, we will have no record at the end of the job except the total hours for installing the total quantity of large pipe of all sizes.

#### Apportioning Time

When a report for one day shows only the total hours worked on two or three sizes of pipe and the quantities of each size installed, this time should be subdivided in proportion to the estimated time on each size. Thus if 16 hours time is reported on 1½ in. and 2 in. pipe and the estimated time on the quantities installed was 6 hours on the 1½ in. and 12 hours on the 2 in., and if total estimated time was 18 hours, the actual time, 16 hours, is 89 percent of the estimated. Therefore, 89 percent of 6 hours, or 5.3 hours, should be charged to 1½ in. and 89 percent of 12 hours, or 10.7 hours, should be charged to the 2 in. This will result in a fairly accurate subdivision of the time. The same method may be applied in any other case where only the total time on two operations could be reported.

It is a good plan to total all figures at regular intervals, say once every two weeks, in order to get a general idea of the progress of the job and the unit

hours of labor on each operation up to date. A recap sheet may be made up for each operation giving quantity of material installed, the total hours of labor and the total cost. Whatever comparisons may be desired with the estimated costs should be shown on this sheet.

If frequently during the progress of the job careful comparisons are made between the estimated labor costs and the actual labor costs, the record system may be called a cost control system, because it furnishes exact information which clearly indicates how best to handle the job. It is not difficult to determine at any stated intervals the actual unit time and unit cost on each operation as percentages of the estimated unit time and cost, also the total loss or gain on labor to date.

#### Final Job Report

Keeping these records on any job costs a certain amount of money and it is an actual waste of money not to record the final results in such form that they will have a permanent value. To have the highest permanent value, the results should be recorded in the form of a comparison with standard data. For each operation a standard time per unit should be set up, then after the actual unit times on all operations have been worked out on a certain job, these should be recorded as percentages of the standard times.

In the case of branch circuit pipe and outlets, the labor records can only show the total time on floor work and the total time on wall work. The final record here would show what percentage the total actual time is of the total time as estimated by the use of the standards.

The records of any one job are never conclusive; we must arrive at our estimating data by taking averages from as many jobs as possible. The method of recording actual time as percentages of standard time is merely the easiest, simplest and best way of arriving at these averages. For example, suppose that the standard time on 2 in. conduit is 27 hours per 100 feet. This standard is listed in the estimator's data book. Job record No. 1 shows that the actual time per 100 feet was only 85 percent of the standard. This is recorded opposite the standard; but the standard presumably rests on some reasonable basis and is not changed at this time; we have merely an indication that the standard

may be too high. Job record No. 2 shows a percentage of 115; so far our standard is confirmed as agreeing with the average of two actual figures. As time goes on, two more job records are obtained giving percentages of 80 and 87. It would now be advisable to change our standard, as we have four reliable records which average 91¾ percent of the standard.

Every estimator has standards which he can use in this manner—the unit times which he uses in estimating, or the unit costs which he uses reduced to hours. However, regardless of the system of estimating used, it is strongly urged that for the purpose of these comparisons the standard times given in the A. E. I. Estimating Manual should be used, for two reasons:

First, the A. E. I. System is the only one in existence which takes into account all of the items which go to make up the total labor on every operation, and which takes into account all the chief conditions on the job which affect the labor costs. The standard times are therefore far more definite than any other standards for estimating.

#### Exchange of Data

Second, comparison of job records with one universal standard will produce results many-fold greater in value than can ever be obtained by each contractor working independently of all others. If eight firms each keep two records, and do not exchange data, each firm will have only their own two records; but if all records are checked against one common standard and the data is exchanged, each firm will have the data from sixteen jobs, which is worth more than eight times as much as the data from two jobs, without increase in the cost of securing the data.

A simple record kept only for the purpose of obtaining labor cost data is well worth while though the results will be in the nature of "intangible assets." If the record system is amplified into a cost control system, a definite and tangible saving in labor costs may be expected. Under average conditions, this saving is conservatively set at 10 percent of the estimated labor cost as a minimum. A full discussion of this phase of the subject is beyond the scope of this article, but correspondence is invited from any contractor who may be interested in this method of increasing the financial return from his business.

# Customer Relations Rules for the Guidance of Wiremen

*How a Los Angeles Electrical Contractor Has Trained His Wiremen to Promote Good Feeling Between Customers and the Man on the Job*

By J. R. WILSON

Los Angeles Electrical Works, Los Angeles, California

THE success of any enterprise is dependent upon the attitude of its personnel toward the clientele it serves. The attitude of each member of the organization must be such as to inspire confidence and create good will between the enterprise and the public. This attitude must be maintained from the highest officer to the employee of lowest rank.

In contracting businesses, particularly those of the larger size, reputation for ability, service and customer relations has a large part in acquiring large contracts. In these organizations unless the desired contract is of great importance or magnitude, the Big Boss very seldom comes in actual contact with the prospective client. The actual getting and signing up of the business is left to others who have proven themselves competent to handle those details.

## Time and Material Work

In the smaller contracting business a great many jobs are acquired through the friendly relations between the boss and his individual customers. This is particularly true of a small firm doing a large amount of "time and material" work. The feeling of confidence which must be engendered and maintained between the contractor and the customer, serves to make this class of business one of the hardest to handle, but also one of the most profitable.

Satisfactory customer relations are dependent upon the attitude maintained by all parties who are in any way interested in, or connected with, the customer contact. This applies especially to the men who are actually doing the work on the customer's premises. Errors in bookkeeping or billing methods, while inexcusable, can usually be adjusted to the customer's satisfaction. But when it is a matter of a customer complaint relating to laziness, inefficiency

or incompetence, of the men actually doing the work on the customer's premises, it is a different matter. The contractor is immediately faced by two problems—fairness to his men, and satisfying his customer. In most cases it is impossible to pursue the middle course. Either the customer's contention must be recognized as legitimate cause for complaint, or efforts must be made to collect the amount as billed. The latter course may result in an expensive lawsuit—with the usual problematic results, while the least that can happen is the loss of the customer.

## Complaints Made Later

As the usual thing, the complaint is not made during the progress of the work, but is made 30 or 60 days after its completion. During the interim, the particular man, or men who did the work may have left the contractor's employ, and may have even left the city. In the latter case the contractor is faced with the proposition of having his whole organization placed on trial, with no witnesses to refute the customer's accusations. Under the circumstances it might appear that the only sensible course would be to make an apology to the customer, and try for as satisfactory an adjustment of the bill as possible. But this is a very dangerous thing for the contractor to do, because it immediately kills the confidence which previously existed in the customer's mind, regarding the contractor.

This is all assuming, of course, that the customer is honestly convinced he has just cause for complaint. We will ignore the class of "gyp" customer who makes a complaint about every bill, wholly upon the assumption that the contractor will reduce the amount of the bill, rather than lose a customer. In handling a customer of this latter type the contractor can pursue one of

two courses—refuse to continue business relations with him, or pad the bills to an extent which will permit of a generous "discount for cash." Either course will eventually lead to the same result—loss of the customer—so it becomes a matter of contracting ethics, "with every man for himself."

After a long and varied experience in dealing with customers' complaints and temperaments we decided to make an effort to eliminate in our own organization the causes of these complaints. A careful study was made of the various complaints received during the past two years. Each complaint was analyzed to determine the fundamental cause. The temperament, known ability, and previous record of the workman was carefully checked. The reaction of the customer to the method of adjustment was also studied.

## Investigation

This investigation consumed considerable time, but it was felt that the hoped for result would justify a great deal of time and study being given to the problem. A compilation of all the available data tended to point to a too lax system in the handling of the wiremen making the installation. This assumption was justified by the fact that 90 percent of the complaints were based upon labor in some form. After considerable discussion between the foremen, the wiremen and the "Bosses," we drew up the "Notice to All Wiremen" as reproduced. Each wireman and helper was furnished with a copy to carry with him. Each new man entering our employ is given a copy and copies are posted throughout our shop in prominent positions.

It may be interesting to study the reasons for each of these rules and to note the results obtained since their introduction.



1. All men must be on jobs at 8 A. M. ready to go to work. No man will report at shop unless through with job, or unless so ordered by his foreman. All men will remain on jobs until 4:30 P. M., unless job is completed previous to that time.

A great many complaints were received about the men either not being on the jobs at 8 A. M., or leaving before 4:30 P. M., or both. The cause of most of this trouble was found to be chargeable to the men's habits of calling at the stock room for some small item of material which they had forgotten to order.

2. Materials wanted on job must be ordered by 4:30 P. M. for the morning delivery of next day, or by noon for late afternoon delivery. "Emergency" deliveries (which will be very few) will be made only upon two hours previous notice to stockman, and then only upon authority of foreman in charge of job.

This rule was previously in effect and had been enforced to a large extent. The trouble shown to exist by Rule No. 1 was caused by the men's efforts to circumvent Rule No. 2.

3. Upon delivery of materials to job, man in charge of job is to check materials against "Blue" sheet, and immediately report any error to stockman at shop, also to foreman in charge of job. These blue sheets must be signed by man in charge of job, and returned to shop, not later than Saturday of each week.

We had received a great many complaints, from both the customers and the men, based upon non-delivery of materials. We had been using a system of duplicate requisition blanks—a white copy from which the order was filled in the stock room, and then turned into the office for billing—and a yellow copy which was left on the job for the workmen. In case of an argument the yellow sheet had a mysterious habit of becoming lost—then it was a case of "passing

the buck" between the stockman and the workmen. It was necessary, of course, that the workmen have a record of materials furnished to the job. It was finally decided to print these sheets in triplicate, making the third sheet blue, and requiring this sheet to be returned to the office, after being checked against the actual materials received. By requiring the workman to sign this sheet we are enabled to stop all of our former disputes between the workmen and the

The men did not seem to realize the importance of having all the information on the time cards. Several times labor was charged to the wrong job, because the workmen put down the job number only. The time-keeper of course charged the labor against the number given. By requiring both job number and name to appear on the card, the time-keeper is enabled to check the cards very carefully, and to investigate if a discrepancy appears. We had a great

deal of trouble on account of the men forgetting to turn in their time cards on Thursday night, which was the day upon which the "pay week" ends. They would put them in any time up to Saturday morning—and expect to receive a full check Saturday noon. The new rule has sure put the damper on that. The last line on this rule requires a little explanation. We do a great many small jobs throughout the month. Some of these are for new concerns just starting up, and we find it much easier to collect as soon as the job is completed. In fact our proposals on these small jobs are always worded "Cash upon completion of work."

5. Upon completion of job all materials, and tools must be assembled together in some place on the job which will not interfere with customer's operations. All wire must be coiled up and tied in bundles, all conduits must be piled up, or tied in bundles, and all items of small materials should be placed in boxes, or sacks. As soon as job is completed call stockman and ask for "pick up" of material and tools. Always give job number, and list of materials and tools to be picked up, also where located on job. Where stockman cannot make "pick up" immediately, return to shop, or other job as ordered. If you have no car, use street car—no waiting on jobs will be paid for.

The need for this rule was shown by the large number of complaints from

## Notice to All Wiremen

Effective from this date, the following rules must be strictly observed by ALL MEN in the Installation Department.

1. All men must be on jobs at 8 A. M. ready to go to work. No man will report at shop unless through with job, or unless so ordered by his foreman. All men will remain on jobs until 4:30 P. M., unless job is completed previous to that time.

2. Materials wanted on job must be ordered by 4:30 P. M. for the morning delivery of next day, or by noon for late afternoon delivery. "Emergency" deliveries (which will be very few) will be made only upon two hours previous notice to stockman, and then only upon authority of foreman in charge of job.

3. Upon delivery of materials to job, man in charge of job is to check materials against "Blue" sheet, and immediately report any error to stockman at shop, also to foreman in charge of job. These blue sheets must be signed by man in charge of job, and returned to shop, not later than Saturday of each week.

4. Time cards must be in shop not later than Friday morning at 8 A. M. NO TIME WILL BE PAID FOR THAT IS NOT IN BY THAT TIME. Time cards MUST contain the following information:

WORKMAN'S NAME  
WEEK ENDING  
JOB NUMBER  
JOB NAME  
HOURS—EACH DAY

On jobs finished before Friday A. M. please try to turn in time cards, so that job may be billed at once.

5. Upon completion of job all materials, and tools must be assembled together in some place on job which will not interfere with customer's operations. All wire must be coiled up and tied in bundles, all conduits must be piled up, or tied in bundles, and all items of small materials should be placed in boxes, or sacks. As soon as job is completed call stockman and ask for "pick up" of materials and tools. Always give job number, and list of materials and tools to be picked up, also where located on job. Where stockman cannot make "pick up" immediately, return to shop, or other job as ordered. If you have no car, use street car—no waiting on jobs will be paid for.

6. Men using their own cars will be paid mileage from job to job and where jobs are outside of City Limits of Los Angeles. On "outside" jobs this mileage will be based on distance from City Limits to job, and return to City Limits. Mileage will be paid at rate of 5¢ per mile. Mileage must be O.K.'d by foreman in charge of job. Parking charges will be paid only on order of foreman.

7. When starting job, foreman in charge will give "layout" to workman. No change in "layout" will be made except on authority of said foreman. This rule also applies to additional work requested by customer. No additional materials will be delivered to job, except by authority of foreman in charge.

8. All journeymen are required to know the Code rules, regarding the installation of power wiring, and commercial lighting. WHEN IN DOUBT ASK YOUR FOREMAN. All men will be required to make corrections on their own time, where such corrections are caused by workman's failure to obtain the correct information from the Code book, or other authentic source of information.

9. As soon as job is completed, turn in drawing so that inspection can be made immediately. See that YOUR drawings are neat and clean, and contain all the information called for by the code. If the job is large, do not try to crowd it all on one sheet—give the inspector a chance. We have plenty of paper.

10. Shop meeting will be held every two weeks, on Saturday afternoon at 1 P. M. All men not working on "emergency work" will be required to attend these meetings, so plan accordingly. We need your ideas, and suggestions, to make this business a success.

11. Remember, you are our representative "on the job." The way you conduct yourself will determine our prestige with the customer on "repeat business." This will in turn affect the steadiness of your employment. DO NOT LOAF ON THE JOB—IF YOU ARE TIRED—TAKE A VACATION. DO NOT ARGUE WITH THE CUSTOMER—WE HAVE MEN WHO ARE PAID TO DO THAT. Abide by the customer's shop rules—if the sign says "NO SMOKING"—DON'T SMOKE. Do not stand around and tell the customer how good a man you are—he can judge that by the time you take to do his job. Do not "crab" to the customer if the stockman is slow on delivery, or sends you the wrong material or tools—we have telephones and foremen to listen to those things.

12. From this date a record is to be kept of the efficiency of each man in our employ. The foremen will do their best to allow ample time to make each installation. Each man will be required to keep within these time limits. We are always for a "square deal" to our men, but a man's term of employment with us, will depend absolutely upon his efficiency, workmanship, conduct on the job, and the number of corrections he has on his jobs.

(SIGNED) CLAUDE HAHN  
J. R. WILSON  
FRED ENOKSON

This Card Given to Each of the Company's Wiremen Has Been a Successful Method of Making Them Really the Firm's Representatives

stockman.

4. Time cards must be in shop not later than Friday morning at 8 A. M. No time will be paid for that is not in by that time. Time cards must contain the following information:

Workman's name;  
Week ending;  
Job number;  
Job name;  
Hours—each day.

On jobs finishing before Friday A. M. please try to turn in time cards, so that job may be billed at once.

the truck driver that he was unable to locate the "return" materials. Upon investigation it was found that the men were careless about where they left these materials—and the customer would move them out of his way. The balance of the rule was instituted to cover a condition whereby the workman without a car was in the habit of waiting for the truck to come, so that he would not have to carry his tool kit on the street car. This led to customer complaints, on "time and material" jobs, of excess labor charges—when the bill was presented.

6. *Men using their own cars will be paid mileage from job to job and where jobs are outside of City Limits of Los Angeles. On "outside" jobs this mileage will be based on distance from City Limits to job, and return to City Limits. Mileage will be paid at rate of 5c. per mile. Mileage must be O.K.'d by foreman in charge of job. Parking charges will be paid only on order of foreman.*

This rule is self explanatory and needs no comment.

7. *When starting job, foreman in charge will give "layout" to workman. No change in "layout" will be made except on authority of said foreman. This rule also applies to additional work requested by customer. No additional materials will be delivered to job, except by authority of foreman in charge.*

#### No "Home Made" Layouts

We had considerable trouble from men making their own lay-outs, with a consequent shortage of materials to complete the job. Under the new rule the foreman makes the lay-out, based upon the estimated materials, and the men are held strictly to that lay-out. We also had trouble with the men doing anything the customer ordered—regardless of who was supposed to pay the bill. Under the new rule no additional work is done, unless the customer will sign a written order for same.

8. *All journeymen are required to know the Code rules, regarding the installation of power wiring, and commercial lighting. When in doubt ask your foreman. All men will be required to make corrections on their own time, where such corrections are caused by workman's failure to obtain the correct information from the Code book, or other authentic source of information.*

We had the usual trouble of mediocre mechanics demanding the highest

wages—without delivering the goods. To overcome this trouble we are now holding strictly to the things set forth in this rule. If a man is unwilling to spend the time necessary to learn the local code rules, he does not deserve our consideration regarding highest rate of compensation. We are getting excellent results from this rule and we are rated among the highest, for standards of construction, with our city inspection department.

9. *As soon as job is completed, turn in drawing so that inspection can be made immediately. See that YOUR drawings are neat and clean, and contain all the information called for by the code. If the job is large, do not try to crowd it on one sheet—give the inspector a chance. We have plenty of paper.*

#### Further Co-operation

This rule is in furtherance of the wonderful spirit of cooperation maintained, between the best contractors of our city and the local inspection department.

10. *Shop meeting will be held every two weeks, on Saturday afternoon at 1 P. M. All men not working on "emergency work" will be required to attend these meetings, so plan accordingly. We need your ideas, and suggestions, to make this business a success.*

11. *Remember, you are our representative "on the job." The way you conduct yourself will determine our prestige with the customer on "repeat business." This will in turn affect the steadiness of your employment. Do not loaf on the job—If you are tired, take a vacation. Do not argue with the customer—We have men who are paid to do that. Abide by the customer's shop rules—if the sign says "No smoking"—Don't smoke. Do not stand around and tell the customer how good a man you are—he can judge that by the time you take to do his job. Do not "crab" to the customer if the stockman is slow on delivery, or sends you the wrong material or tools—we have telephones and foremen to listen to those things.*

Study this rule carefully. It is "the kernel of the nut." When the men can be made to realize the true meaning of their relation with the customer, as the contractor's representative, capital and labor will be placed upon a basis of mutual interests and benefit. We are getting fairly good results at present, but far from the goal which we hope ultimately to attain.

12. *From this date a record is to be kept of the efficiency of each man in our employ. The foremen will do their best to allow ample time to make each installation. Each man will be required to keep within these time limits. We are always working for a "square deal" to our men, but a man's term of employment with us will depend absolutely upon his efficiency, workmanship, conduct on the job, and the number of corrections he has on his jobs.*

This rule is being followed in all its various phases, and is the basis upon which all "raises" are considered. The men are beginning to realize that "no efficiency" means "no raise" and are using their very best efforts to reach the standard of requirements. We hope to eventually build up an organization where each workman's slogan will be "The Best—No Less."

We have lately added another rule, as a means of eliminating customer complaints about labor on "time and material" jobs. When we place the man, or men, on one of these jobs, we inform the customer that we will expect him, or his authorized representative, to O.K. each man's time card—each day. If the man shows up late on the job, or leaves early, we expect the customer to note this on the time card before signing same. This rule has the effect of curbing the customer's usual desire to dispute the amount of labor charged against his job. We find that the customer does not realize the amount of detail work connected with every electrical installation. It is usually rather easy to show him where the materials were used. But labor—"That's something else again!"

#### Electric Homes By the Dozen

The idea of the all-electric house is gaining ground in England, one of the latest bits of evidence being that the Ilford Electricity Department (Central Station) has erected twelve model homes, equipped electrically throughout with the exception of one grate for burning coal. The English have been accustomed to grate fires for so long that it would perhaps be impossible to deprive any home of them entirely. However, the rest of the conveniences and necessities are electrical where possible. The houses are let to employees of the Ilford department and several have been used for exhibition purposes.



# The Changes Worked by a Quarter Century

Electrical Contractors of Today Are Found by the Old-Timers to Have Both Advantages and Disadvantages Over Their Forerunners of Twenty-five Years Ago

JUST twenty-five years ago this summer there met at Buffalo a small group of men who felt that the electrical contractor and dealer had problems of a national significance that demanded a national organization for their solving. Accordingly they founded the National Association of Electrical Contractors, which is now known as the Association of Electragists, International. The association has coped with and settled many of the problems that were troubling the industry then; but with the change in conditions over the years has come a change of problems. New

ones present themselves every day and call for new methods of solution.

What these changes have been and the difference between present conditions and those of a quarter-century in the past are known to nobody better than the men whose views are presented below. Each is a charter member of the association, having attended that first annual convention and their outlook upon two-and-a-half decades of electrical contracting has an authoritativeness possessed by few others in this field.

## The Personal Touch

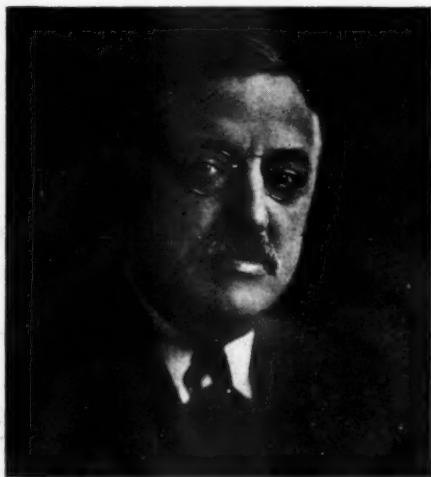
By James R. Strong, New York

In my judgment, there are two outstanding points of difference:

First, the increase in the number of contractors out of proportion to the increase in the volume of work to be done. It is easier to start a contracting business without sufficient financial

with the work which the contractors had twenty-five years ago. The highly paid superintendent, be he ever so good, cannot have the vital interest in the business which the owner of the business has. The few successful contracting companies of today are those who are their own superintendents; who supervise their own work and thereby get greater efficiency in the labor they employ; who know their costs from practical experience, and are unwilling to do the cutting of original bids and gambling in extras, which is apt to be the policy of the larger contracting firm. In other words, a few concerns of today are limiting their business to what they can personally supervise, and are carrying out what was the rule twenty-five years ago when large contracting concerns were unknown and the owner of the business knew his business and was reasonably successful.

construct for the future not only with electrical materials but with people and principles out of which they have made the foundation and started the structure of what will be the greatest industry of civilization. But they were not too seriously minded to miss the fun that might be had. Some will recall even now with a happy grin the early morning gathering in Buffalo on the meeting day and



James R. Strong

backing now than it was twenty-five years ago because of the fact that a large number of jobbers and others are eager to extend credit and thus obtain an outlet for their goods.

Second, the creation of large contracting concerns with large organizations and highly paid superintendents has done away with the personal contact

## Orderly Increase of Strength

By M. H. Johnson, Utica, N. Y.

Your inquiry about the changes in the electrical contractor industry during the past quarter century brings to mind many pictures of the organization meeting of the National Association during the Columbian Exposition at Buffalo in 1901. The group who issued and answered the call for that meeting were all strenuous young men—not a grey hair nor a wrinkle in the lot and it held the men with foresight and the wish to



M. H. Johnson

the ambulance used to carry the New York delegation from the station to the Iroquois Hotel. A friendly gesture and not without its useful suggestion.

No radical changes have occurred in the technique of wiring since that time. Conduit is more generally used. Armored conductors and fittings have im-

proved and of course the amount and intricacy of installation has developed enormously.

The growth of the industry has been like the growth of the electrical contractor into the electragist and the growth of the National Association of Electrical Contractors into the Association of Electragists, International. An orderly increase of strength and intelligence keeping the service at all times fully able to meet all demands made upon it.

The foremost accomplishment has been the conception of the Council on Industrial Relations for this has shown the world how the organized employer and organized labor can cooperate without friction to produce a strikeless and efficient industry. An example which will doubtless be copied throughout the industrial world as its practical benefits are better understood. This is the triumph of intellect over brute force in handling labor questions.

It is the supreme contribution of the first quarter century of the Association's life. Granted that each coming quarter may give an equivalent and its name will be called blessed for all times.

### Modern Plan Is Large Volume and Small Margin

By Charles J. Sutter, St. Louis

Time has wrought quite a change since the inception of the Association. In the olden days an established contractor was looked upon as an expert who advised the architect and other interested parties and was depended on to deliver an installation which reflected his individual ability and knowledge. He had his price and his reputation



Charles J. Sutter

usually brought a preference. Materials were few and delays experienced in delivery entailed carrying stocks. The inventive ability of the contractor was a factor in his success, the results of his efforts later being passed on to the manufacturers. (Many successful devices of today originated in a contractor's shop. Some of these devices 15 to 25 years old are still giving good service.)

Today most contractors are operating on a large volume and small margin basis with their work reflecting no personal effort (unless an opportunity to save presents itself) and in many cases the foreman or superintendent is the only official of the firm at all familiar



with the details. As a result competition has increased in bounds and price is usually the determining factor in lettings.

The attraction of the young man for anything electrical seems inborn. This together with trade conditions favoring a beginner also is a factor in present day progress.

The engineer or architect prepares the work and the contractor becomes a mere installer confining his efforts principally toward delivering the work at the least possible cost.

### Works Harder Now

By James F. Burns, Schenectady

There is no difference only he works harder today than he did twenty-five



James F. Burns

years ago, if he is just starting in, because he has more opposition and less profit than in the early days.

The appliances of today cost more and a contractor has to have more money to invest starting than he did twenty-five years ago. Labor is dearer and harder to get and gives less hours. If he starts in a small city he may make a go of it. If he starts in a large city he will work hard to get a living out of the game.

Selling electrical goods in conjunction with the contracting business is a great help if he is not in a city where there is a manufacturer that competes against him and sells at factory cost as in my city. They did not do this twenty-five years ago.

### Specifications Have Improved

By J. P. Hall,

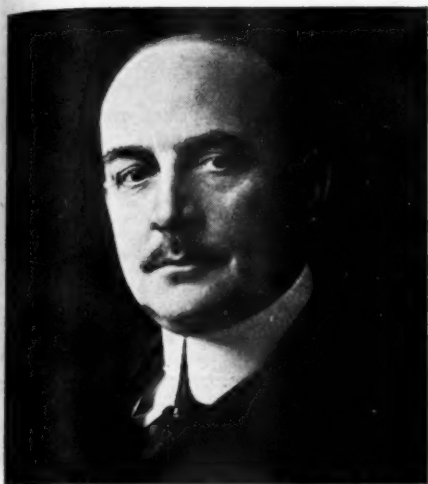
J. P. Hall-Smith Company, New York

The particular way that electrical contracting of today differs most from the electrical contracting of twenty-five years ago is due to commercialism.

The electrical contractor, due to natural progress and competition in the business, has lost what he cherished most of all in the early years, "Pride." He no longer can give his work that personal contact and attention that he once did; this comes partly through competition and to the improvement in plans and specifications that are prepared by others.

It is questionable if the owner today gets the value through this competition that he did when the contractor was placed on his own merit to make good. In making good he leaned towards the owner's interest; while today the con-





J. P. Hall

tractor is not obliged to do more than what he contracts to do in a standard form contract.

While today's standardization in materials and workmanship is far superior to that in days gone by, there is an essential spirit that is lacking and that to me is "Pride."

However, the electrical contracting business of today is on a firm basis, it is a grand and glorious business and is bound to improve with the advancement of everything in the electrical line.

### Growth of Specialization

By E. S. Keefer,  
The Rawlplug Co., Inc., New York

One of the outstanding changes in the electrical industry, in my view, has been the development of specialization. At the time of the founding of the association the functions of the manufacturer, the jobber and the contractor were very



E. S. Keefer

often being performed by the same individual or concern, although the contractor had even then begun to find his niche in the industry. Since then contracting has become not only a special science but many firms are even confining themselves to special lines of contracting. When I first entered the employ of the Western Electric Company, it had three lines—manufacturing electrical material, distributing it to contractors and installing it on contracts obtained by my department, the contracting department. All this has changed now, with each section of the industry having its own place and very few firms trying to combine any two of the functions.

### Progress in Materials

By J. C. Hatzel, New York City

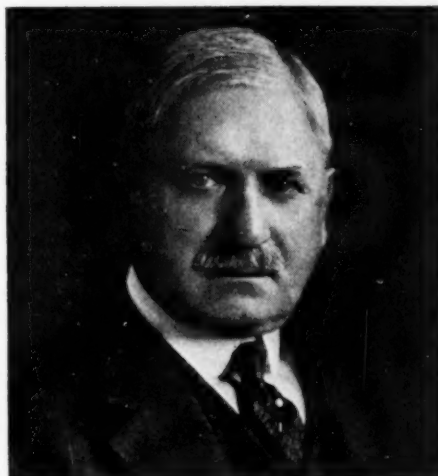
A most outstanding change in the electrical industry has been the perfecting of materials and wiring technique. This was just getting under way at the time of the Buffalo meeting. The insulation of conductors at first consisted of cotton impregnated with paraffin. A little later came the so-called Underwriter's wire of cotton impregnated with white lead. Then we had weather-proof and finally rubber and varnished cambric.

Concealed wiring was run under floors, secured with iron staples and laid in plastered walls. Wiring on the surface was secured by wooden cleats. Then came wooden mouldings, paper conduit about 1889, lined iron conduit in 1892 and finally our present day, unlined enameled and galvanized conduit.

Appliances in the early days consisted only of lamp sockets, switches and cutouts—all on wood bases. Plug receptacles and a multitude of other appliances were unknown. Electric household appliances were unthought of.

Incandescent lamp efficiency has had a wonderful growth from the carbon filament lamp of 4 to 6 watts per candle to present day Mazda lamps.

The ability and efficiency of mechanics in the industry has kept pace with the improvement in machinery, apparatus, etc. and construction is on a par with the older mechanical trades. Where originally the mechanics, if they may be called such, consisted of linemen, carpenters, machinists, shoemak-



J. C. Hatzel

ers, bakers and candlestick makers, we now have mechanics trained and skilled in electrical construction of all character.

### Good and Bad Contracting

By E. D. McCarthy, Buffalo

The methods of the contractors themselves have changed but little in this time for while there are many successful contractors of proven ability and knowledge of proper business methods, there is the same proportion today as twenty-five years ago of irresponsible contractors, who without adequate training or financial backing, with no knowledge of costs or of proper methods of arriving at them, and with an utter disregard of overhead, take contracts for electrical installations of any size and kind, and if able to complete them usually find themselves at the end without any profit and probably without enough money coming to them to recompense them for the time spent.



E. D. McCarthy

# *The Electragist*

Official Journal of the  
Association of Electragists—International

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Editor

H. H. STINSON  
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## **On To Cedar Point!**

The annual gathering of electrical contractors and dealers—the convention of the Association of Electragists—will be held this year at the famous Ohio lakeside resort—Cedar Point—August 24 to 27.

In past years, important men from different branches of the electrical industry have addressed the meeting on large national topics of a more or less general nature. This year the sessions will be addressed by contractors and dealers who are successful. They have been asked to tell in detail exactly how they operate—how they are able to cut down expenses. Plenty of time will be provided for discussion so that any questions that are asked might be fully answered.

It doesn't make any difference if you are a big contractor or a little fellow; if you specialize in contracting, in retailing or the fixture business—there will be something there for you which will be worth far more than the cost of the trip.

The exhibits are more numerous than ever before and will cover the greater part an electragist's supplies.

And on top of it all enough time has been allowed for a swim each day and a lot of other sports, while each night there will be entertainment of some sort with special provisions for the ladies.

On to Cedar Point, August 24-27!

## **Who Is Responsible?**

There is no question but that the average home is underwired. But who is to blame?

Manufacturers, jobbers and central stations would have one believe that the fault lies almost entirely with the electrical contractor because he has sold by cutting price.

Undoubtedly some of the blame is his, but the heart could not be cut out of the average house wiring job if the public had been sold on good and adequate wiring.

What have the manufacturers, jobbers and central stations done to educate the public?

The manufacturers have given thousands of dollars to the National Electric Light Association to improve utility public relations and it was a good job. When are they going to wake up, however, to the fact that while public relations are to be greatly desired for the power companies, it is adequate wiring that is necessary if the public is to be

adequately served, if the industry is to grow and expand?

The refrigerator manufacturers are banded together to sell the public the idea of electric refrigeration, the lighting fixture people have a similar program in mind. These are fine, but what of the others?

The central stations have the job of selling the public on the idea of more adequate wiring. From more outlets they derive more revenue year after year.

The roofing manufacturer, copper and brass people, lumber, tile, brick and many other kinds of building supplies manufacturers are now engaged in cooperatively selling the idea of their product to the public—and the public apparently likes it because sales are leaping by bounds.

But the electrical people?

## **Side Stepping**

"Unsubstantiated" was the verdict of the Council on Industrial Relations for the Electrical Construction Industry in the union made and labeled lighting fixture case. The complaint was made by the Association of Electragists and heard by the Council on April 8. Since that time the Council has made further efforts to secure evidence and claims it has been unsuccessful.

It is undoubtedly true that the Council was not able to secure direct provable testimony that unions were "restricting installations to union-made lighting fixtures." Even though an individual might have evidence that he could state was of his own knowledge and not hear-say, he would probably not care to present his facts for fear he might get in trouble with the union.

But forget the evidence. The Association of Electragists was not interested in prosecuting anybody or any organization. It was interested primarily in a principle—that should have been evident to the Council.

That the employers' national organization made a complaint regarding a condition should have been sufficient evidence in itself that a situation existed which needed clearing up. There were few men on that Council who did not believe that restriction existed in more than one city.

The Council was not asked to pass upon the evidence. It was asked for the expression of a policy. The Council knew what was wanted. Why did it side step?



## Fixed Prices

Frequently, competitive conditions become so intolerable that the local contractors in their desperation search about for some way to fix prices. Sometimes it is so much per outlet, sometimes so much per hour.

It makes no difference what the plan of fixed prices is, it can't succeed. No fixed price plan ever has succeeded for more than a limited time.

If the price is low enough to keep out outsiders and price-cutters, it won't work because so few of the local fellows will be able to do business at that price.

If the price is high enough to admit everyone now in the business, it will be high enough for any new comer to crawl under and take the business away from the others.

Any attempt to standardize price in this fashion puts a premium on carelessness. A man who is able to cut down his overhead by virtue of his ability to manage his business properly should not be made to forego his advantage over a contractor who has not the ability or desire to reduce his overhead.

There is, however, a way to band together for mutual protection that is effective. The only reason it is not in operation in more places is because it means work, interest and the unflagging desire on the part of each one to hold up his end.

For those who really want to protect themselves against cut-throat competition, we suggest the following: Study costs not only of installation but of management. Learn from these costs how the low man does it. Learn how to estimate and how to figure overhead, and be sure it is covered on every job. Insist that the inspectors make everybody live up to the local ordinance in every particular and insist that they do not permit sub-standard material to be used on any job. Insist that the jobbers who finance the price-cutters grant the same credits and help to association members. Insist that architects and owners carefully inspect installations to make sure they are getting what the plans and specifications called for.

If in the face of this, the price-cutters can still operate they are entitled to, because they will have proved that they know how to conduct their business more efficiently.

## The Unpardonable

Just one piece of carelessness is going to cost a certain eastern contractor a lot of business. He wired a garage—at a profitable price—and didn't test for grounds. Two months later the customer got his first light bill after the garage had been wired—it was for \$48. His average bill was formerly around \$3 a month.

Of course the contractor repaired the job as soon as he heard about it but he didn't compensate his customer for the loss of current, and, what was worse for him, he didn't and couldn't prevent the customer from telling all his friends about the big light bill he was "stuck for." Naturally, in telling it he told about the contractor's carelessness.

The contractor never will know just how much in lost

business that little piece of carelessness has cost him. The public might kick at what they think are high prices of a certain contractor and still patronize him, but carelessness—it is hard to pardon that.

## Three Of His Competitors

Recently one of the better known contractors was saying that competition on large work was becoming harder than ever because of new men who were entering the lists of bidders. "Only last week," he said, "I was bidding on a job and three of my competitors were men who not so long ago worked for me."

This new competition in the large construction field is beginning to be felt. Foremen and superintendents are launching out for themselves, taking a job here and a job there, finishing one before they start on another.

What has caused this new competition? Is it a necessary economic development, or may it be due to a general weakness in the electrical construction industry?

These men do not create any more construction work, nor do they improve the contractor's relations with architects and builders, for these men do the work for far less than any regular contractor can do it.

If these men can get jobs for themselves as individuals, why can't they as foremen get jobs for their employers? When they are handling their own work they are very efficient and they permit no inefficiency on the job by any one else. Why can't they do as well for an employer?

When one attempts to answer these questions, he finds what is probably the answer to this entire situation. The men want and need an incentive.

There is no particularly good reason why a contractor should lose a superintendent or foreman whom he wants to keep. Make them partners and let them rustle for business the same as though they were on their own. Let them have a compensation based upon their ability to make money for the concern—that is the way they would be compensated if working for themselves.

If the contractors won't give these men a chance to improve their conditions by offering such an incentive, the men will make their own way. It may be true that the majority of them may not make good by themselves, but while they are finding out they are taking a lot of business away from their former employers.

Encourage the men to bring in business for the concern and encourage them in the proper way—by extra compensation. If the foremen or superintendents can manage work in such a way as to save money—share that saving with them. Keep the men on their toes with the feeling that in working for you they are in reality working for themselves. If they are really in earnest give them a share in the business. They deserve it, and besides they will then feel that they are in business for themselves.

The proper incentive will unquestionably reduce this new competition, will make more money for the foremen and superintendents and make a lot more money for the boss.

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Electric Employers' Association (C) .....					

(C) designates exclusively Contractor-Dealer organization.

(L) designates an Electrical League

# JULY ACTIVITIES

## Council Finds Fixture Restriction Complaint Unsubstantiated

Decision Based on Inability to Obtain Definite Evidence That Unions Were Restricting Installation of Non-Union Fixtures and Case Is Dismissed

THE decision of the Council on Industrial Relations of the Electrical Construction Industry, handed down on June 24, declares in effect that it has not been able to secure any evidence substantiating the complaint that the unions were making efforts to restrict installations to union made lighting fixtures.

The matter first came up at the Electragists' Convention last September, when a resolution was passed referring the efforts of certain local unions to restrict installation to union made and labelled lighting fixtures to the Department of Justice.

### Questionnaire Sent

Later, however, it was decided to refer the matter to the Council on Industrial Relations for the Electrical Construction Industry. The matter was received by the Council in January, and the first hearing was conducted on April 14. Since that time, the Council has attempted to secure evidence from different individuals by means of a questionnaire and otherwise.

In rendering its decision, the Council stated that it believes "it could with propriety have closed the case following the public hearing. However, the Council preferred to give every opportunity to all interested to present competent evidence and furnish information having bearing on the case at issue and therefore, has made extraordinary efforts to obtain information and facts relating to the matter.

"A questionnaire requesting information was sent to fifty or more prominent manufacturers and dealers, who were considered as interested in this matter, but less than one-fourth responded, and these replies were very conflicting and contradictory. Seeking further evidence, the Council unsuccessfully undertook to secure information

pertaining to this case from the Managing Director, Association of Artistic Decorative Lighting Equipment (Formerly National Council Lighting Fixture Manufacturers) and the Chairman of the Board of Governors of the Electrical Board of Trade of New York City.

"The Council considers that approximately three months has been sufficiently long enough for those interested to submit evidence, and believes that it has obtained all possible information from those interested and therefore, closes the case with the following decision:

*"That, the complaint filed by the Association of Electragists, International, regarding the claim set forth in their resolution pertaining to 'Effort of the Unions to restrict installations to union-made lighting fixtures' was not substantiated."*

G. P. Rogers, managing director, Artistic Lighting Equipment Association, when interviewed following the release of the decision, stated, that he refused to be a party to the investigation because his association had no desire to become involved in labor matters.

### Documents Unavailable

Charles L. Eidlitz, chairman of the board of governors of the New York Electrical Board of Trade, stated that his reason for refusing to appear before the Council was that he did not wish in any way to compromise his organization.

"We were not a party to the submission," said Mr. Eidlitz, "and as we were not willing to be bound by the decision we did not feel we should take any part in the hearings.

"As all our documentary evidence is in the hands of the United States Attorney for this district it would have been impossible to substantiate our

statements, had we attempted to make any."

## May License Youngstown Electricians

According to action taken at a special meeting in July of the municipal council of Youngstown, Ohio, an ordinance providing for the examination and licensing of electrical contractors will probably be in effect in that city in the near future. The draft of the ordinance passed its second reading at this meeting.

The ordinance had been prepared at the request of the Youngstown Electrical League and provides for a yearly license fee, ranging from \$20 to \$40. Violators of the ordinance would be subject to a fine of from \$10 to \$500.

## Local Associations Turning to Picnics and Field Days

The custom of setting aside one day each summer for a picnic or outing seems to be growing among local associations of electrical men, five such festivities having been reported within the last few weeks.

Among them was the outing of the Independent-Associated Electrical Contractor-Dealers of Greater New York, which took place July 17 at Oakwood Heights, Staten Island. This is a perennial, the first such field day having been celebrated in 1905. Starting with a luncheon, the affair went onto an entertaining program of games and dancing, with a baseball contest between the Independent-Associated team and a team of Staten Island electrical men.

On June 8 the Nassau-Suffolk Electrical League went on an outing to Brightwaters and enjoyed a dinner, after which the election of officers was held, with results as follows: F. C. Brown, president; George L. Fanshold, first vice president; G. H. Nagengast, second vice president; G. W. Laselle, treasurer; William Alrich, financial secretary, and H. T. Hobby, secretary.

A large attendance, totaling over



500, signalized the third annual outing of Milwaukee's electrical industries, held at Waukesha Beach on July 22. The following week the Wisconsin Electrical Contractors and Dealers Association went on a two-day boat trip up the Wolf river as their annual summer get-together.

Two hundred electrical men picnicked at Morgantown on the Potomac on July 13 on the third annual outing of the Washington (D. C.) Electrical League. The program included dancing, swimming, games, boating and a dinner.

On July 29 the Allentown (Pa.) Electrical Club, composed of members of the Lehigh Valley Electrical Association, held its third annual stag picnic.

### Southern California Now Has Electragist Motor Section

A motor section, corresponding with the merchandising section so successfully maintained by the California Electragists, Southern Division, has been formed by that organization to consider matters of interest in motor and power work. This section, it is expected, will be functioning actively in the near future. The merchandising section, it was also announced, will continue its activities in the fall and, in addition, will direct electragist Red Seal activity through a sub-committee, the personnel of which will be composed of additional members chosen from the membership at large.

In connection with the Red Seal work of electragist members there, the association has put into effect a plan for Red Seal Alternate Proposals. These are forms on which the contractor submits to prospects a Red Seal bid, at the time he submits the ordinary job bid.

### More Cooperative Advertising for Appliances

At a meeting with the manufacturers of household electrical appliances held at Atlantic City during the recent convention of the National Electric Light Association, it was determined to continue the plan of cooperative advertising and selling campaigns on such articles.

Plans were made for fall, winter and spring (1926-27) campaigns covering heaters, general gift line for the holi-

days, waffle irons, toasters and percolators.

Plan books have been ordered in large quantities by the manufacturers, and are also being sent out to all members of the National Electric Light Association.

### Florida Electragists to Discuss State Inspection Bill

The subject of uniform state inspection and legislative means to accomplish that end will be the main topic of discussion at the meeting of the Florida Association of Electragists which will be held at Tampa, August 12. At a recent meeting a committee was appointed to draft such a measure for presentation to the state legislature and it is expected that this committee will have its report ready for discussion by the date of the Tampa meeting.

A joint meeting of the Tampa and the St. Petersburg contractors will be held on the evening before the state meeting and all out-of-town contractors will be invited to attend.

### Power Club to Meet in October

The fall meeting of the Electric Power Club will be held at Briarcliff Lodge, Briarcliff Manor, New York, on October 25 to 28 inclusive.

## Not to Hold Special Meeting on Sheathed Cable Rules

N. F. P. A. Executive Committee Decides It Is Powerless to Change Decision Arrived at in Open Meeting

THE Electrical Committee, N. F. P. A., will not hold a special meeting to reconsider the rules for sheathed cable in order to secure approval of the American Engineering Standards Committee.

As reported in the July ELECTRAGIST the standards body referred the 1926 revised code back to the sponsor body, the National Fire Protection Association, with the request that an attempt be made to secure a more general agreement. At that time the Electrical Committee had before it the proposed compromise rules for sheathed cable offered by the Association of Electragists.

The executive committee of the N. F. P. A., however, at its meeting on June 29 determined that it was without auth-

### Winnipeg Contractors Elect Officers

The election of officers of the Winnipeg Electrical Contractor-Dealers Association was held at the last regular meeting held June 24. The following were elected:

President, Fred Shipman; McDonald & Willson Lighting Company; executive committee, J. H. Schumacher, Schumacher-Gray Company; M. R. Bywater, Gamble, Passey & Bywater Company; A. Levvy, Levvy Electric Company.

The former president, E. T. Bubbs, is, under the constitution and by-laws, vice president for the coming year.

The sixth member of the executive committee has not as yet been elected, as the secretary for the coming year has not been appointed and this office carries with it membership on the executive committee.

### Accountant for Southern California Electragists

The services of an accountant for the members of the California Electragists, Southern Division, have been made available by the action of the executive committee in appointing Vernon Hunter as the organization's official accountant.

ority to reverse the action of the Association taken at its regular meeting in May.

The proposed special meeting, therefore, of the Electrical Committee to consider the compromise rules will not be called since the sponsor body cannot act on the report of such a special meeting before it would act upon a report from the next regular annual meeting. This automatically prevents any consideration of compromise rules before the 1927 spring meeting.

Upon receipt of this information THE ELECTRAGIST asked A. R. Small, chairman of the Electrical Committee, if the 1926 Revised edition would be printed and distributed and he said that no provision had been made therefor.

## Southern California Convention Marks Close of First and Highly Successful Year

Southern Division of State Electragists Hears Resume of Association's Accomplishments and Plans for Future at San Diego Convention

**A**N interesting and well-attended convention, at San Diego on June 26, marked the close of the first full year's existence of the California Electragists, Southern Division, and the delegates, after hearing a summing up of the past year's activities, expressed their determination to make the second year even more resultful than the first. More than two hundred members and guests were present at the meeting.

The program was opened on the morning of June 26 by an address by H. H. Walker, president. He sketched the steps that had been necessary to establish the association and then outlined what had been done since its establishment. One of the accomplishments was the promotion of a spirit of co-operation between jobbers and contractors, particularly in the field of credit relations and generally in the field of trade policy.

Following this came the report of the newly organized motor section, which as yet is in the process of formation.

The value of proper methods of estimating was the subject of the report of the estimators' section, read by R. L. Booth. He pointed out that while there is quite a wide variation in the comparison of the quantities of the material taken off, yet it is in the estimate of the labor that are found the widest differences. Therefore, he said, the labor estimates are receiving the special attention of the section and most of the data collected thus far has been along this line.

At a later date, he announced, the architects' committee of the section will, by circular letters and by direct contact with the architects, make known the complaints of estimators and will recommend such procedure as shall make existence a little more tolerable for them.

The report of the merchandising section was presented by O. N. Robertson, who stated that the future volume of electrical business must come from an increase in the sale of labor-saving devices in the home rather than from electrical installations in large buildings.

The Red Seal Plan was given the place of prominence at the afternoon meeting. It was declared that the most important problem before the industry was to sell the Red Seal Plan to the public.

A members' meeting was held at the close of the afternoon general session and officers of the division were re-elected as follows: H. H. Walker, president; Frank McGinley, vice president; and C. W. Jones, secretary-treasurer.

The annual banquet and ball were held in the Pompeian room of the Hotel San Diego that evening.

### Philadelphia Inspector Warns Against Substandard Material

The installation of sub-standard material in the Philadelphia territory has been halted by a warning, broadcast by Washington Devereux, supervising engineer of the Philadelphia Fire Underwriters' Association. The card, which was sent out to jobbers and contractors, bore the following notice:

"Only materials, appliances and fittings which are standard and which have been approved and listed by Underwriters Laboratories, Inc., will be accepted in this jurisdiction when installed in accordance with the National Electrical Code."

In answer to the request of THE ELECTRAGIST, Mr. Devereux issued this statement to explain the situation:

"It has been our established practice for years to accept only materials, devices and appliances which have been approved by Underwriters Laboratories, Inc. Recently, however, there has been an effort made to place on the Philadelphia market sub-standard switch and outlet boxes. This has caused complaints on the part of manufacturers, and in order to avoid delays in the introduction of current or requiring contractors to remove sub-standard materials which they had bought in good faith, we thought it but fair to send out a notice of caution because we

had authoritatively learned that jobbers had misrepresented to contractors some of the goods they were selling. As for instance, switch boxes contained in a carton would have labels stating that they were approved standard material, where, as a matter of fact, they were not.

"I one time heard a very prominent gentleman of the industry say, 'We would all be much happier and make more money if we were strictly honest with each other.' That has been some twenty years ago. The same thing holds good today, apparently. In any event, the card was intended to be helpful to the contractor and to the jobber so that he would not stock up with sub-standard material which he would pass on to the contractor, and in the final analysis the public would suffer. As a whole, our jurisdiction is pretty well free of practices of this kind because our jobbers do observe the practice of years, to handle only materials of an approved type."

### New Offices for Cincinnati Contractors Section

New officers for the contractors' division of the Cincinnati Electric Club were elected at a meeting held at the club rooms during July. The following members were elected to office: Garfield Winkler, president; John Becker, vice president; and J. F. Riehle, secretary-treasurer.

It was announced at the meeting that the contractors' division in company with the other divisions of the club is planning to get behind a plan similar in some respects to the Red Seal but which is said to be broader in scope than that plan. Details of the movement are to be announced in the near future.

### Red Seal Progress

Licenses to operate the Red Seal Plan have recently been granted to the Albany Electric League, Albany, N. Y.; the Electrical League of Columbia, S. C., and the Electric League of Chattanooga, Tenn., according to the announcement of the Society for Electrical Development.

An application for license has been received from the Electrical League of Northern Illinois, Lake County Section, Waukegan, Illinois.



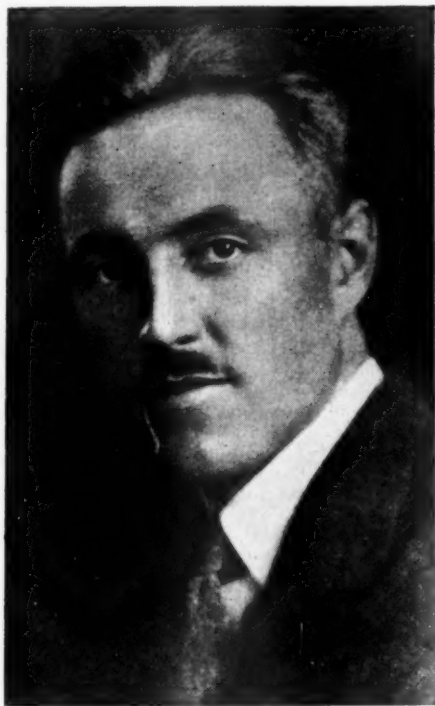
## Cleveland Contractors Open New Headquarters

The Electrical Contractors Association of Cleveland has established new headquarters at 332 Chester-Twelfth Building, where the business of the organization will be carried on. The association now numbers fourteen concerns.

Officers of the organization are R. C. Baumgardner, president; D. Schlesinger, vice president, and F. T. Manahan, secretary.

## Bakewell Now Representative of Denver League

George Bakewell, Jr., for two years field representative of the Electrical League of Colorado, has been appointed representative of that organization, handling the duties of the late S. W. Bishop.



George Bakewell, Jr.

Mr. Bakewell, upon being discharged from the army, started his career in the employ of the Emerson Electric Company, St. Louis, Mo. Shortly thereafter he moved to Denver and entered the newspaper field. In 1922 he became associated with one of the local advertising agencies and continued in that activity until his appointment, August 21, 1924, as league field representative. Largely through his efforts a number of Denver's new office build-

ings as well as many residences have been adequately wired for the use of electric service. He has been instrumental in the adoption of the Red Seal plan of wiring in Denver and adjacent territory.

## Camp Cooperation Program Announced

The program for Camp Co-operation VI, which will be held at Association Island, Henderson Harbor, N. Y., September 1-4 next, has been drawn up by the league council in co-operation with the Society for Electrical Development.

Prior to the opening of the conference there will be special meetings on August 30 and 31 of the members of the league council, officers and secretary managers of leagues licensed to operate the Red Seal Plan; a joint session of the league council with secretary managers of leagues; a meeting of individual members of the society who attend the conference, and a meeting of the advisory publicity council of the Society for Electrical Development.

## Indian River Electragists Meet at Ft. Pierce

The July meeting of the Indian River Association of Electragists took place at Fort Pierce, Fla., on July 12, with an attendance of about twenty. A chicken dinner was served and the business session was occupied mainly by a talk given by Charles E. James on the subject of "Outlets." The next meeting is to be held at Melbourne on August 9.

## Kansas City Plans Electric Show

The decision has been made by the Kansas City Electric Club to hold an electric and radio show at the convention hall sometime during early fall. It will take place probably in the week of September 27 or that of October 4. A special show committee has been elected by the directors and a company has been incorporated to handle the promotion of the exhibit.

A new constitution and set of by-laws have been adopted by the club.

## Fixture Manufacturers' Convention Approves Extension of Activities of Their Association

Report of Managing Director Provides for Widespread Cooperative Advertising, Aggressive Merchandising and More Orderly Policy of Distribution

AN extensive change in the work of the Artistic Lighting Equipment Association, known formerly as the National Council of Lighting Fixture Manufacturers, is looked for as the result of the annual convention, held at Montreal June 23 to 26.

The proposed association activities, as covered by the report of G. P. Rogers, managing director, includes the development of the consumer market and of the dealer and other markets through co-operative effort, a yearly national exhibit, the development of foreign trade and co-operation with allied interests in the industry.

Research is also to be carried on in the departments of cost accounting, credits and collections, traffic and transportation, employment and trade relations; and statistics will be gathered on commercial and industrial subjects appertaining to the industry. Simplification and standardization in

the industry will also be a subject of research.

The program covers a period of four years before it will be completely operative. One of the subjects dwelt on by Mr. Rogers was the wastefulness of the present system of distributing lighting fixtures. He declared that if the industry were better organized, the advantages of having a definite trade policy would become apparent. Action on this, however, is not expected to be taken for some time.

It was disclosed that there still existed a large demand for the old type G18-5 and G25 lamps and that the association had induced manufacturers to continue production of these types.

New officers of the association are: President, Fred R. Farmer, Beardslee Chandelier Manufacturing Company, Chicago; vice president, J. W. Schulze, Alfred Vester Sons, Inc., Providence, R. I.; managing director, G. P. Rogers.

## Southern California Electragists Employ New Field Man

The work of the California Electragists, Southern Division, has increased to such an extent that the executive committee has decided to put another man in the field.

Hobert W. Barnes, formerly secretary of the Pasadena Branch of the California Electragists, has been chosen for this position and has already started his work.

Mr. Barnes will handle all the communities outside the city of Los Angeles except on special occasions and C. J. Geisbush will concentrate in the city of Los Angeles.

## Opposition Develops to Evansville Licensing

The licensing clause of the electrical ordinance of Evansville, Ind., is being opposed through court proceedings by Jesse Elbert, electrical contractor of that city. It is said that a number of other Evansville contractors are in sympathy with the suit, but that the large majority of the electrical men there are in favor of retaining the licensing clause in the municipal ordinance.

A permanent injunction against the code as far as licensing is concerned

has been obtained from the circuit court. However, the city is preparing to take the case to the Supreme Court and the expectation of its legal advisors is that the right to license contractors will be restored to the municipality.

## General Electric Orders Show Increase

Orders received by the General Electric Company for the first six months of 1926 totaled \$165,405,720, representing an increase of 10 percent over the \$150,315,228 booked in the corresponding six months of 1925, President Gerard Swope has announced.

For the three months ending June 30 this year, orders totaled \$78,972,062, compared with \$66,468,992 for the second quarter of 1925.

## Electrical Credits Better

Delinquent electrical accounts during June showed a decrease both in number and volume as compared with June, 1925, according to figures released by the National Electrical Credit Association. The total amount overdue for June, 1926, was \$192,591 as compared with \$209,780 for the same period last year, or a decrease of 8.9 percent. The number of accounts overdue was 1,528 as compared with 1,670 in June, 1925.

## New York Contractors Probe Motor Distribution

Problems of motor distribution are engaging the attention of New York contractors and a movement is now on foot to propose some plan of distribution which will be equitable both to the manufacturers and the contractors.

The inception of the movement took place at a meeting of the entire contractor group of the New York Electrical Board of Trade, held on June 24th at the Board rooms. It was brought forth at the meeting that present methods of purchase and sale are unsatisfactory to most contractors and that they feel something should and must be done.

After long discussion it was resolved to appoint a committee which, after investigating conditions, would prepare a concrete plan. This committee was appointed at a later meeting. Their proposals, when ready, will be presented to the group at a special meeting and will, if approved by the contractors' group, be presented in turn to the Board of Governors of the Electrical Board of Trade. If the approval of the latter body is obtained, the plan will then be put before the motor manufacturers and their support of it asked.

## New Electragists

The following contractor-dealers have made application for membership and been accepted into the A. E. I. since the publication of the last list in the July issue:

### CALIFORNIA

**Glendale:**  
Broadway Electric

**Los Angeles:**  
Bert L. Perry, Inc.

**Porterville:**  
Frank O. Sheldon

### CONNECTICUT

**Waterbury:**  
Warren Elec. Co.  
The Waterbury Elec. Rep.  
& Engrg. Co., Inc.

**Winsted:**  
Holmes the Electrician

### FLORIDA

**Apopka:**  
Ray's Elec. Shop

### INDIANA

**Lafayette:**  
Brassie-Bowers Elec. Co.

### MARYLAND

**Baltimore:**  
Fred'k. Clagett  
Francis S. Dorsey, Inc.

### MASSACHUSETTS

**Boston:**  
Herbert S. Potter Co.

**Fall River:**  
Mt. Hope Elec. Co.

**Haverhill:**  
Herbert W. Porter

**Lowell:**  
Derby Elec. Motors Co.  
Eugene Myers

**Milford:**  
Henry L. Schultz

**New Bedford:**  
G. H. T. Brown & Co., Inc.  
Hawes-Farmer Elec. Co.  
A. C. Smith Co.  
A. C. Thompson

### Worcester:

The Electric Shop

### MICHIGAN

**Detroit:**  
Frank Bailey  
Fred N. Corvinus  
Henry Cramer  
Frederick Elec. Co.  
James Hodge  
George Huysentruyt  
Jackson Elec. Co.  
Wm. E. Theakston  
Wagner Elec. Co.  
T. J. Watson  
William W. Wilson

**Fordson:**  
Walter J. Summers  
Wensing & Bigham

**Highland Park:**  
John J. Wida

### NEW YORK

**Brooklyn:**  
D-O-D Electric Co.

### PENNSYLVANIA

**Altoona:**  
J. E. Heaps Elec. Co.  
Kenho Elec. Shop

**Wilkes-Barre:**  
Murphy Elec. Co.

### WISCONSIN

**Milwaukee:**  
American Appraisal Co.

### CANADA

### ONTARIO

**Windsor:**  
Gilbert Campeau  
Duncan & Moore  
Millen Elec. Co.  
F. Pithie  
Wesley Elec. & Radio Sup.  
Co.  
G. S. Whelpton



## OBITUARIES

### Charles A. Coffin

Charles A. Coffin, founder and for thirty years head of the General Electric Company as president and chairman of the board of directors, died Wednesday night, July 14, 1926, at his home, Locust Valley, Long Island.

Up to within two weeks of his death, Mr. Coffin had been regularly to his office in New York and continued his active interest in the progress of the electrical industry and more particularly the General Electric Company, of which he was a director.

Charles Albert Coffin was for thirty years the financial and commercial genius of the General Electric Company. Prior to the formation of that company, in 1892, Mr. Coffin was a dominant influence in the Thomson-Houston Electric Company.

It was through his leadership that the company developed the central station idea as applied to arc lighting, and in 1888, he induced the company to enter the electric railway field, manufacturing equipment for electric street car lines in many parts of the country. A number of other electrical concerns were absorbed, most notable among them being the Brush Electric Company of Cleveland.

In 1892, occurred the consolidation of the Thomson-Houston Company and the Edison General Electric Company of New York, in which all the activities and interests of Thomas A. Edison's incandescent lamp development had previously been merged. Mr. Coffin and the Thomson-Houston Company were the dominant influences in this amalgamation.

When the consolidation was consummated, in April, 1892, under the name of General Electric Company, Mr. Coffin was immediately elected president, and served in that capacity for the succeeding 21 years.

### Charles E. Scribner

Next to Thomas A. Edison, the late Charles E. Scribner, who died on June 25th at his summer home, Jericho, Vermont, held more patents in the electrical field than any other inventor. He was credited with a total of 441.

For 23 years Mr. Scribner was chief engineer of the Western Electric Com-

pany, New York. For six years prior to his retirement he was consulting engineer. In his early days he worked with Mr. Edison and their association resulted in a life-long friendship.

The first multiple switchboards to be used commercially were of his design. Now his work is evidenced almost wherever telephonic communication is found around the globe.

### Frederick W. Newman

Frederick W. Newman, founder and former president of the F. W. Newman & Sons, Albany, N. Y., and one of the charter members of the Association of Electragists, International, died at his home in Albany on July 2. Mr. New-



Frederick W. Newman

man was a pioneer in the electrical industry, having installed the wiring for the first telephone system in the northern part of the state, being then employed by the Albany Telephone Company, the predecessor of the New York Telephone Company.

Mr. Newman, seventy-six years old, had been suffering from a partial paralysis of his face for several months and this, with complications, resulted in his death.

He was born in England in 1850 and came to this country when he was twenty-three years old, engaging immediately in telephone work. Later he went into the electrical contracting business and built up a firm whose name was widely known. At one time he served as president of the New York State Electrical Contractors and Dealers Association and he was always active in local, state and national organization work.

### Franklin S. Terry

Franklin S. Terry, vice president of the General Electric Company and for years a leader in the incandescent lamp business, died suddenly of heart failure at his summer home at Black Mountain, near Asheville, North Carolina, on July 23. Mr. Terry was born in Ansonia, Conn., in 1862, and held his first position with the Electrical Supply Company of Ansonia. In 1889 he organized the Incandescent Lamp Company of Chicago and in 1901 the National Lamp Company, of which he was a founder, purchased the Sunbeam Company.

### News Notes Concerning Contractor-Dealers

The Central Electric Company, Baltimore, has recently been merged with the Electromechanical Company of the same city and the combined business will be carried on under the name of the latter company.

Roy A. Holmes has purchased the bankrupt stock of the Conneaut (Ohio) Electric Service Company and will conduct the business under the name of the Holmes Electric Service.

The new Olympic Electric Company, 2307 West Spokane Street, Seattle, Wash., has been opened by W. A. Carte, former branch manager of the C. B. Campbell Electric Company.

Clark & Mills, electrical contractors, have moved to new and larger quarters at 37a Brattle street, Cambridge, Mass.

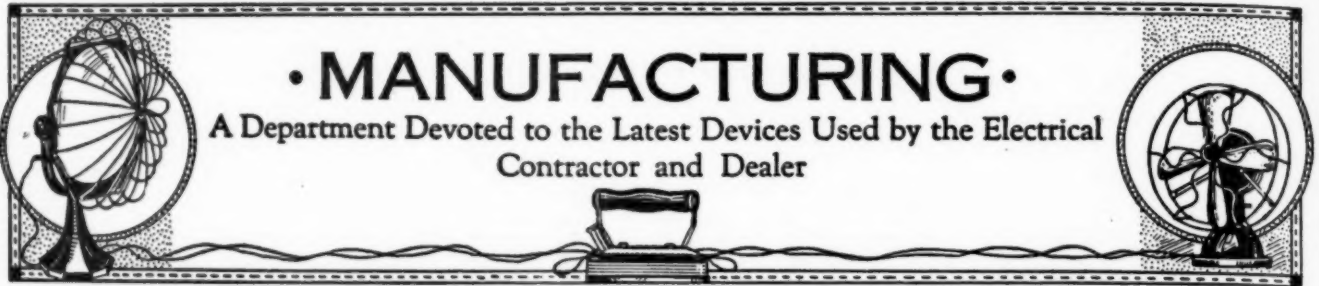
P. E. McCarty and Andy Caverly have established an electrical store at 214 East Main street, Robinson, Ill.

C. J. Strecker has entered the electrical business at Wolcottville, Ill.

Constance LePage has moved his electrical business to 223 Madison street, Jefferson City, Mo.

The Coutts Electrical Company has opened a new store at 260 Madison avenue, Perth Amboy, N. J.

The Electric Shop, 121 East Third street, Moscow, Ida., has been bought by C. N. Adams.



### Canopy Switch

Pass & Seymour, Inc., are placing on the market a thin type of canopy switch with an especially short body and narrow in width. It is designed with the wires leading into the narrow side of the body. This allows the switch to be used for French back and other small bracket fixtures.



The small size of these switches and heavy rating make them a standard device for the fixture designer and assembler.

The new thin body is  $\frac{1}{4}$ -in. and will fit in a small type of bracket. The width is less than  $\frac{3}{4}$ -in. Straight-away wires and the compact body allow a narrow design of bracket.

The new switch is designed with parallel wires running straight from the switch body without bend or break. The wires are 6-in., No. 18 stranded New Code wire, with a special cover that prevents defacing the walls during installation. The ends of the wires are stripped one inch for quick wiring.

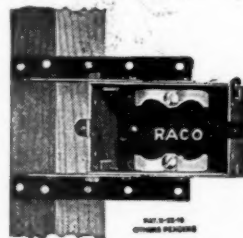
### Window and Flood Lighting Units

Two new units, one for window lighting and the other for flood lighting, are now being made by the Pittsburgh Reflector Company. The window lighting unit, catalogue Number 500, accommodates either the 300 or the 500 watt lamp, giving a concentrating beam of light similar to previous types but with a higher candle-power maximum. It is equipped with an adjustable bracket for attaching to the ceiling of the show window or other supporting surface. Universal motion of the reflector may be secured by loosening the one thumb screw. The reflector may then be tilted to any desired position.

The flood-lighting unit, designed particularly for use at the Sesqui-Centennial at Philadelphia, consists of a cast metal base, sheet-metal housing for lamp and reflector, tinned and painted aluminum outside and inside, cast aluminum focusing mechanism and silver-plated glass reflector. It is built so that a color cap may be slipped over the lamp bulb, eliminating breakage of the color medium.

### Wiring Devices

The Roach-Appleton Manufacturing Company, Chicago, is now manufactur-



ing a new lath support for application to its set-up box and bar hanger and a new receptacle box with extended ears.

The lath support for bar hangers will be sold separately and will fit any flat bar type of hanger  $3/16 \times 1\frac{1}{2}$ -in. dimensions, either straight or offset types.

The lath support slips on the bar, being held in place by two pairs of clips



and is easily brought to position close to the box where it serves, by means of two lath holders to hold the ends of the cut laths close to the box in a secure manner.

This does away with the necessity for use of wooden strips or headers in order to find a convenient means of securing a cut lath.

The lath support is also made long enough so the ends will extend behind the solid lath on either side of the box, preventing the box from tilting and also strengthens the entire installation.

The new receptacle box with patented

extended ears on sides is all ready to nail direct to studding and makes a correct and rigid installation for base receptacles. This convenience can be furnished when specified with any type of switch box at a reasonable advance in price.

### Color Lighting Equipment

Curtis Lighting, Inc., announces that new and complete color equipment is now available for X-Ray reflectors Nos. 400, 410, 500 and 510. These units follow the same general shape as the rims of the reflectors. They may be used when the reflectors are recessed with X-Ray cast ceiling flanges as well as when they are attached to conduits or channels in the usual manner.



Each "Color-Ray" consists of a metal frame, with spring clip attachment to fit inside the edges of the reflectors, and one each of red, blue, green and amber gelatins. Dimples, located inside and just above the lip of the reflectors, receive the clips so that the frame will fit securely.

The two sections of the metal frame supporting the different gelatin color media are held together with split rivets. These can be removed with ease when the gelatins are changed, and the frame can be assembled and replaced with equal facility.

### Control Devices

A number of new devices for motor control have recently been placed on the market by the General Electric Company. One consists of synchronous motor and condenser panels for the control of synchronous and super-synchronous motors connected to slow-speed pumps or to air or ammonia condensers when the motors are self-started through General Electric autotransformers.



# X-Ray Color-Ray



**JACK** reflector for  
150-watt lamp uses  
Color-Ray No. 440.



**QUEEN** reflector for  
200-watt lamp uses  
Color-Ray No. 55.

**JILL** reflector for 150-  
watt lamp uses Color-  
Ray No. 441.

The Color-Ray No. 55 is shown above ready to clip on to the King reflector. All the new Color-Ray equipment includes four sheets of gelatin in amber, green, blue, and red, with each set.

## Colored Light Stops Them!

Passers-by always crowd about the show windows flooded with colored light.

Merchants everywhere realize the important part color is playing in sales-display. Profit by this sentiment by selling X-Ray Color-Ray! It is light, strong, and inexpensive, and is becoming more popular daily.

*Every Merchant Needs the Color-Ray!*

**CURTIS LIGHTING, Inc.**

1119 West Jackson Boulevard  
CHICAGO

New York—31 W. 46th St. Los Angeles—3113 W. 6th St.

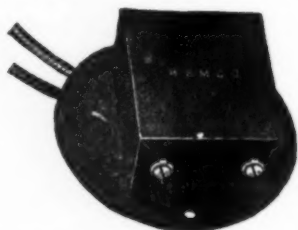
Another device is the CR3105 drum type controller for use with direct-current adjustable-speed motors. This is particularly adaptable for use with motors that drive machine tools requiring frequent starting, stopping or speed adjustments.

For general purpose applications the company has devised an automatic reduced voltage starter for synchronous motors. This is adaptable especially to motors driving pumps and motor-generators.

The CR7022-A1 automatic starter has been designed to provide overload protection by means of a temperature overload relay. It is for slip ring induction motors.

### Bell Ringing Transformers

George Richards & Company, 557 West Monroe street, Chicago, have recently placed on the market two new types of bell-ringing transformers. One designed for residences and small apartments, is mounted on a round outlet box cover and can be furnished mounted on either a 3 $\frac{1}{4}$ -in. or 4-in. cover. The 4-in. cover is equipped with a knockout for drop-cord installation to the same outlet box. The 3 $\frac{1}{4}$ -in. cover is not equipped with a knockout.



This new type transformer has an advantage in that the transformer is grounded and attached to the outlet box, so that a drop-cord may be run from the same box.

The terminals are ten inches long. They are furnished with one black and one white wire. The terminal nuts cannot be hacked off.

The other transformer is also designed for residences and small apartments, but is encased in steel. The case is 2 $\frac{3}{4}$  in. long, 2 $\frac{1}{4}$  in. wide and 1 $\frac{1}{2}$  in. high. The capacity is 25 watts; primary 110 volts and secondary 8 volts.

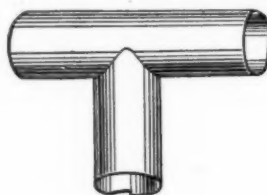
The transformers are made in both single-circuit secondary and three-circuit secondary types. The single-circuit type delivers 8 volts on the secondary side. The three-circuit secondary type delivers 6-12-18 volts respectively when installed according to directions.

### Door Switches

Two new door switches have been added to the line of the Arrow Electric Company, Hartford, Conn. Both switches come complete in an approved box, with 23/32-in. knockout and clamp for flexible metallic conduit. One type provides that the light is on when the door is open, and the other that the light is on when the door is closed.

### Speaking Tube

The Roach-Appleton Manufacturing Company, Chicago, has started manufacture of a new speaking tube and accessories, consisting of a square elbow and tee. The devices are of the lock-seam type and are 1 inch in diameter. The tube comes in five-foot lengths and is packed 500 feet to a carton.



The tube comes in five-foot lengths and is packed 500 feet to a carton.

### Manufacturing Notes

Walter F. Ingals has been elected president of the Central Tube Company.

The Vandy Metal Specialty Company, Inc., is the new name of the business conducted by B. A. Vandy. The company also moved to new quarters at 7 Prospect street, Rochester, N. Y.

The Day-Fan Electric Company is the new title of the firm formerly known as the Dayton Fan & Motor Company, Dayton, Ohio.

C. H. Van Der Bloom is now sales representative for the Fullman Manufacturing Company, Latrobe, Pa., in the states of Ohio, West Virginia and Kentucky and the city of Erie, Pa.

New sales representatives have been appointed by the Autovent Fan & Blower Company, Chicago, as follows: Arthur E. Bacon, Denver; Allied Industries, Inc., Portland, Ore.; R. M. Booth, Cincinnati; and E. H. Briggs & Company, Ltd., Winnipeg.

A new branch office and warehouse has been opened by the Graybar Elec-

tric Company at Asheville, N. C. Another announcement of the company is that new quarters will be occupied by the Omaha branch on November 1. New appointments announced are those of A. B. Vandercook as assistant manager and H. T. Simmons as sales manager of the Los Angeles distributing house, and R. A. Stoner as head of the Scranton, Pa., sales office.

The Safety Cable Company, Chicago, has established a consolidated warehouse in Chicago which will carry the wire and cable products of the Safety Cable Company, the A-A Wire Company and the Phillips Wire Company.

The Newark Electrical Supply Company, Newark, N. J., is now occupying its new warehouse at 152 Mulberry street.

Clarence Wheeler, president of the Wheeler-Green Electric Company, Rochester, N. Y., has announced the intention of the company to retire from the retail business effective at once. The jobbing business of the company will be continued.

L. R. Stebbins has been appointed export sales manager for Pass & Seymour, Inc., succeeding Joseph McElroy. Other changes in personnel announced by the company are the appointment of Stanley D. Whitford, sales representative in the New England states, and the transfer of George D. Senior to specialized work in the New York territory. W. Brewster Hall will act as district sales manager for New England and New York.

The Killark Electric Manufacturing Company, whose factory was destroyed by fire in September, 1925, has just completed a new plant having 25,000 square feet of floor space.

B. M. Horter has been appointed manager of the Boston office of the Cutler-Hammer Manufacturing Company.

A large and complete catalogue of its products has been published by the Hart & Hegeman Manufacturing Company, Hartford, Conn., and is now being distributed to contractors. It shows seventeen new products added to the company's line since the issuance of the last catalogue.